







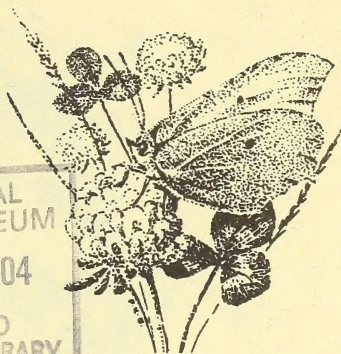
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# Invertebrate Conservation News

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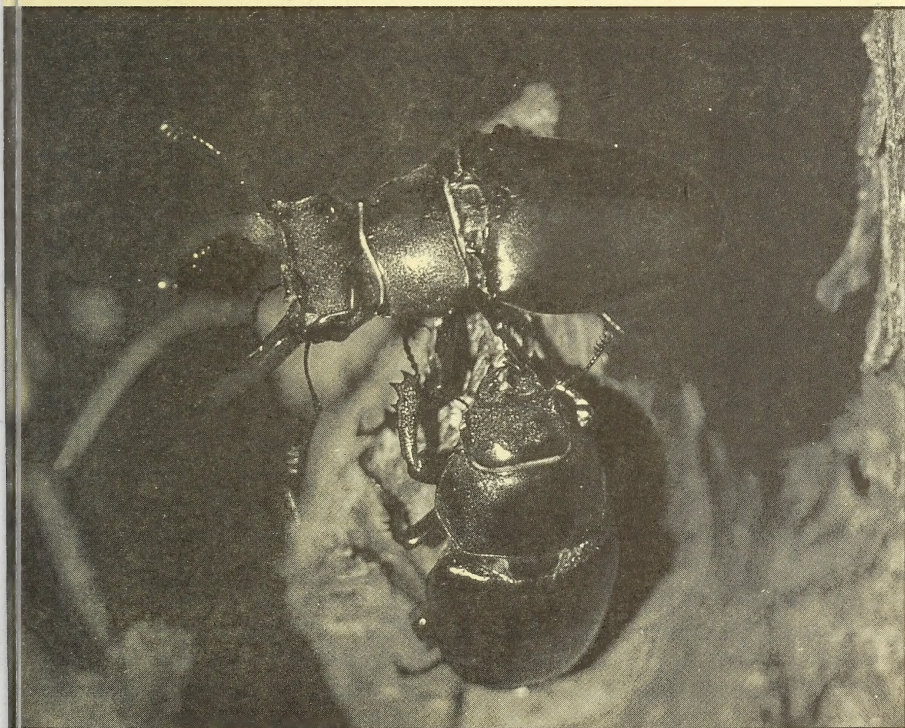
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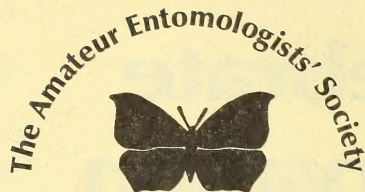


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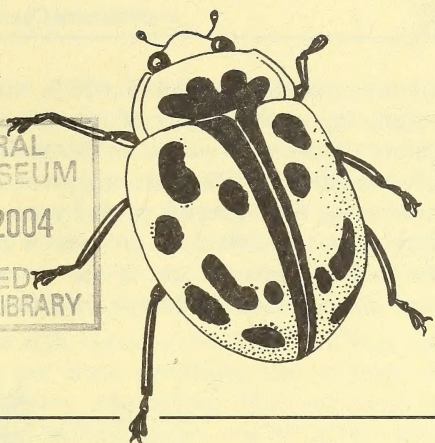
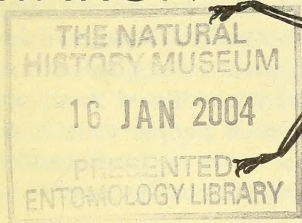
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# INVERTEBRATE CONSERVATION NEWS



Vol. 41, June 2003

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## EDITORIAL

The "Hazel Pot beetle" (see this issue of *ICN*) is a good example of an endangered species which could easily be wiped out regionally or nationally by inappropriate conservation management. The difficulty is in defining what is "appropriate" or "inappropriate".

Any form of site management is advantageous to some species and detrimental to others. If we perceive that a lack of management has led to a loss or degradation of a relatively rare type of habitat, we may wish to re-establish an earlier regime of management or something approximating to it. The decline of the Hazel Pot beetle may have been due partly to an abandonment of traditional coppicing, and might therefore be alleviated by an increased resumption of this practice. Conversely, the wholesale clearance of scrub for the restoration of heathland or grassland could destroy the beetle's habitat in its few remaining haunts in the UK.

Any gardener should understand the need to consider objectives for management. Someone with a perfectionist trait may decide to create a "perfect" lawn, in which case there will probably be no toleration of any "weeds", worm-casts and other features, which the same person could have regarded as desirable if the objective had been different. A perfectionist trait is arguably essential for success in some walks of life and should perhaps be admired rather than derided. It can, however, combine dangerously (sometimes lethally) with a faulty objective or remorse.

One of the joys of gardening, as compared with conservation management, is that one is free to indulge one's whims. It is possible to encourage wildlife at the same time, but preferably in the light of knowing something of the habitat requirements of the various wild



plants, animals and fungi which may occur in one's garden. All too often, the requirements of invertebrates are at best perceived only in terms of nectar sources for butterflies. Birds, on the other hand, are often artificially fed, with unknown consequences for the invertebrates which are then preyed upon by an inflated avian population. It might represent some form of progress if people were to regard the artificial feeding of birds as one of the many self-indulgences of the gardener and not as a contribution to wildlife conservation.



## NEWS, VIEWS AND GENERAL INFORMATION

### Brownfield development in the UK

As this issue of *ICN* goes to press, the UK government has been reaffirming its policy of "predict and provide" for the supply of new houses, especially in the already crowded south-east of England. Apparently, the demand for houses must be balanced by supply if the UK is to succeed in its hoped-for economic convergence with the European Union. Meanwhile, despite growing evidence of the great wildlife value of many brownfield sites, the government seems to be sticking to its parallel policy that new housing should be built on brownfield sites always in preference to greenfield sites. Thus, the situation looks rather depressing from a conservation viewpoint, at least as far as invertebrates (i.e. most of our fauna) are concerned.

Some recently circulated news seems to confirm the UK government's determination to sweep biodiversity under the carpet as far as brownfield developments are concerned. This concerns a legal action by the European Commission (EC), challenging the official guidelines under which the UK's local planning authorities (i.e. councils) make decisions on applications to develop sites. The news item reads as follows: "The EC has warned that UK environmental impact assessment (EIA) guidance wrongly directs councils to ignore their obligation to assess major urban brownfield developments and so it is taking the Government to the European Court of Justice.

"The move follows long pressure by the EC in support of complaints about the failure to require completion of an EIA before approving the





700m White City redevelopment in west London. The issue has been the subject of lengthy debate but in the end London failed to persuade councillors that a development involving 60,000 sq m of retail space with 6 ha of land set aside for 4,500 parking spaces had no environmental impact worth assessing. It is one of the largest development projects in the country." The EC is quoted as saying that the government's published guidelines tend to steer local authorities away from proposing EIAs for urban projects on previously developed land.

As reported in previous issues of *ICN*, many of the local and regional conservation NGOs in the UK are now extolling the virtues of brownfield sites for wildlife and for education. This message is increasingly being delivered to government via Wildlife and Countryside Link (WCL), particularly through the efforts of Matt Hardlow, who sits on WCL as the representative of Buglife – The Invertebrate Conservation Trust. As not all the proponents of non-invertebrate wildlife have conventionally regarded brownfield sites as being of key importance, Matt has by no means always found himself pushing at an open door.

In May 2003, Buglife and the Royal Entomological Society held a joint seminar on brownfield invertebrates, with some very interesting presentations about the range of species found on brownfield sites and the ways in which surveys have been conducted so as to inform developers and planners. Some of the stories told sadly of the total destruction of habitats, but there were also case-studies in which development had been integrated with habitat conservation. In many ways, the meeting was a rallying point for brownfield conservation, but it also carried the sobering message that our case for influencing planners and central government is often weaker than we imagine. For example, we may draw attention to the presence of species "of conservation concern" in support of protecting a site, but the argument is sometimes weakened by new evidence that the species concerned are much less scarce than had been previously thought.

At the time of the May seminar, the "Guardian" newspaper carried a full-page article on the threat posed by development to the exceptional brownfield fauna of Canvey Island in Essex, to the east of London. A separate item on this can be found in this issue of *ICN* under "Sites and Species of Interest". The Canvey island story was a considerable boost to the brownfield cause, but it is probably true that most politicians, journalists and the public at large still know little of the conservation value of brownfield sites. Until there is a wider awareness of the issues, the balance of power will remain in favour of habitat destruction.



## SITES AND SPECIES OF INTEREST

### Designation of protected sites in Wales

This item is based on a report by Adrian Fowles of the Countryside Council for Wales, submitted to Invertebrate Link for the period April 2001 to March 2002. In the meantime, Adrian has provided his report for 2002-03, from which we hope to quote in the next issue of *ICN*.

The report focused on the evaluation of sites as candidates for designation as Special Areas of Conservation (SACs), in accordance with the EC Habitats & Species Directive. Under this Directive, member states have to establish SACs so as to protect certain defined types of habitat and a range of listed species.

Among the candidate sites (cSACs) in Wales, there are 34 occurrences of species listed on Annex II of the Directive. In 23 of these cases, the species concerned are officially classed as "Qualifying Features". For example, there are two cSACs for the snail *Vertigo geyeri*, one for *V. angustior*, and one for *V. moulinsiana*. Another mollusc, the Pearl mussel *Margaritifera margaritifera*, has one. Other aquatic invertebrates on Welsh cSACs include a crustacean - the White-clawed crayfish *Austropotamobius pallipes*, and the Southern damselfly *Coenagrion mercuriale*. Of the ten currently known populations of *C. mercuriale* in Wales, all but one occur on cSACs.

A butterfly with special status in Wales is the Marsh Fritillary *Euphydryas aurinia*, which has disappeared from many other parts of the UK and of continental Europe. As its remaining 140 Welsh populations represent about 45% of the UK resource, it has merited special attention in the evaluation of cSACs. Subject to some continuing questions about sites boundaries, it appears that 34 populations will be included on SACs. Designation of these sites as SACs involves notifying them to their owners as Sites of Special Scientific Interest. When proposing the boundaries for these sites, CCW is taking into account the metapopulation dynamics of *E. aurinia*. For this reason, potential, but currently unoccupied, habitat is also being included. This approach marks a significant departure from previous practice throughout GB, presenting a much better opportunity for achieving "Favourable Conservation Status" for this highly threatened species.

### Giant earthworms in Oregon, USA

The Oregon Giant earthworm *Driloleirus macelfreshi* is an endangered species, confined to the Willamette Valley in the Pacific Northwest of





the USA. It is said to grow up to 3 feet (0.9 m) in length and 1 inch (2.5 cm) in diameter, and to burrow down as far as 15 feet (5 m) during summer drought. The following story, under the title "Digging for Giants" has been circulated to us; it appeared in *Sierra* magazine (March/April 2003), at: <http://www.sierraclub.org/sierra/200303/forms.asp>

William Fender is an unassuming man – thin, with a pallid complexion and wire-rimmed spectacles. When he steps into the Oregon woods wearing a pair of faded, hole-pocked jeans, there is a quiet rightness to the scene; an old hippie sort of tranquillity. The only thing that seems odd is the pitch of the shovel. Fender, 52, carries it high over the ground and loose in his hands, like a priest holding the censer while dispensing incense in church. The shovel dangles and swings and, as Fender strides over the moss and ferns and rotting, felled limbs, he registers these sights as a sort of background music. What he is looking at, really, is the dirt.

William Fender is the foremost authority on the Oregon Giant earthworm, which lives in one of the nation's soggiest and worm-richest areas, the Pacific Northwest. It is he who wrote the definitive 1995 paper "Native Earthworms of the Pacific Northwest," which notes that the region's 100 indigenous species favour "fine textured" soils rich in clay. He's most likely to find the giants here in the Willamette Valley, the 2,000-square-mile flatland surrounding Portland, where the Missoula flood deposited hundreds of feet of mucky sediment – perfect worm habitat back in the late Pleistocene. The Oregon Trail pioneers who tilled this soil in the 19th century turned up thousands of them. And today, their progeny could still be around. Maybe. The valley is now home to 2 million people and vast berry farms and hazelnut orchards, and twisting amid all the Wal-Marts and air-conditioned tractors are regions of invasive European worms, which are the reddish-brown wrigglers we're used to hooking on fishing poles. Humans do plenty of damage to native worms, slicing them up while working the soil, and ruining their habitat with chainsaws and pesticides. But the Euro worms, which arrived stateside centuries ago in the ballasts of boats, inflict their own harm: Each time they swallow and excrete the giant's beloved acidic soil, they make Oregon's dirt more neutral in its pH.

The giant is elusive. Still, though, he digs – always three fast, deep cuts at the soil and he bends to pore over the dirt. We search for an hour. We find dozens of European worms – "weeds," Fender calls them, and at one point Fender snaps his head forward, rapt over a wormhole he finds in a dirt clod. "Hmm," he muses. "Promising."



But that's all it is – promising. The hole's maker has long since retreated deep into the earth, and eventually we head back to the car, hopeful that down the road, in the next swathe of woods, the giants are waiting for us.

### **Hazel Pot beetle in Lincolnshire, eastern England**

A recent issue of "Natural World" magazine carried a report of some success in the species recovery plan for a rare (RDB1) leaf beetle, *Cryptocephalus coryli*, which has been dubbed the Hazel Pot beetle. The adults average 7 mm in length, the females being orange and the males orange and black. According to English Nature's Invertebrate Action Plan, its known distribution in England is now confined to one site each in the southern counties of Berkshire and Surrey and one site in the eastern county of Lincolnshire. It used to be more widespread in the southern half of England in the middle of the 20th Century, but records suggest that it has always been rare or erratic in its appearance.

The adults have been found on various woody plants, of which the main ones are hazel *Corylus avellana* and birch *Betula* spp. in the south and just birch in Lincolnshire. The larvae, which appear to feed on leaf litter, are encased in "pots" made of their own dung. The pots are initially constructed by the adult female, who lays her eggs within them. The larvae split the pots as they grow, each time enlarging them with a fresh green strip of dung.

The beetle's habitat seems to occur mainly in birch or hazel scrub, either on calcareous grassland or on woodland edges, rides or hedgerows. The currently known habitats occur in sunny, open patches of birch scrub within sheltered areas of heathland, where soil conditions are rather dry.

The success story is one of captive breeding and re-introduction into a suitable habitat. After the re-introduction of captive-bred beetles into Lincolnshire Wildlife Trust's Whisby Nature Park in 2000, a new generation of adults emerged in the wild. Dave Bromwich of the Trust is quoted as saying "We are finally understanding what the beetle needs to complete its life cycle and we can now reverse decades of decline. It's the first time that a rare beetle has successfully been re-established as part of a conservation project in Britain." Following this success, further introductions are planned at sites in the country where the beetle has become extinct.

As this beetle is dependent on scrub for its habitat, its plight represents an interesting example of the damage that could be done by





appropriate management in the form of wholesale scrub clearance for heathland or grassland restoration. There do not appear any documented cases of this particular species having been made locally extinct in this way, but the danger clearly exists. One of the stated aims of the action plan for the beetle is to make conservation managers aware of this and other scrub-dependent invertebrates. Within woodland, a possible reason for the beetle's decline is a reduction in the practice of coppicing, rather than any mis-applied conservation management.

Despite the recent success of re-introduction at Whisby Nature Park, there remains a need to know more about the factors that make some sites suitable and others unsuitable for the beetle. A survey of former sites has failed to locate any existing populations. According to English Nature, current knowledge suggests that it ideally needs rotational birch coppice in very sheltered conditions. Its tolerance to grazing is unknown, but could be monitored at the Lincolnshire site, where grazing by sheep has begun. Such questions have formed the basis of a PhD study at Leeds University, which is the Lead Partner in the beetle's Species Recovery Plan. The project was set up also to investigate the ecology of the other species of *Cryptocephalus* in the UK Biodiversity Action Plan.

## **Canvey Island: negotiations over an exceptional brownfield habitat**

The site on Canvey Island to the east of London could become something of a *cause célèbre* in the defence of brownfield habitats within the planning system. We do not currently have any first-hand reports of the species and habitats on the island but, as mentioned above in "News, Views and General Information", an article on the case has appeared in the "Guardian" newspaper. We cannot currently check the accuracy of all the information in the article. It does, however seem to be based on carefully quoted statements from well-known invertebrate specialists, and we will therefore mention some of the details.

The site concerned was formerly owned by Occidental Petroleum and is said to occupy 50 acres (20 ha). It now falls within the UK government's plans to develop the "Thames Gateway" and has therefore been earmarked for a planned business park. Indeed planning permission had been granted before the involvement of English Nature (EN), the government's own statutory conservation body for England.



Dr. Chris Gibson of EN is quoted as saying that there is information about a large number of scarce invertebrates on the site. He referred specifically to a survey of the Shrill Carder bee *Bombus sylvarum*, which has suffered a major national decline and is a Biodiversity Action Plan (BAP) Species. The site appears to be the core of the bee's largest population in the UK (see *ICN* 33 about the Shrill Carder bee in Wales). Another BAP bumblebee found at the site is the Brown carder bee *Bombus humilis*.

Dr. Peter Hammond, another invertebrate specialist interviewed by "The Guardian", commented on a ground beetle, *Scybalicus oblongiusculus*, for which the only records in the UK had previously been from Dorset, apart from one sporadic occurrence at Kew Gardens. It had been considered extinct in the UK, and so there is a strong need to find whether there is a breeding population at the Canvey Island site. Peter Hammond also mentioned the ladybird *Platynaspis luteorubra*, which is a rare species associated with ants tending root aphids. The Canvey Island site is the only recorded location for this ladybird in the county of Essex.

Another beetle thought to be extinct in the UK, but found at the site, is the weevil *Sitona cinerascens*. Richard Jones, an entomologist well known to many *ICN* readers, spoke to "The Guardian" about this find. Formerly regarded as a variety of *S. cambricus*, it had been recorded only once before in the UK; in Scotland in the 19th Century. Richard commented that brownfield sites are unpopular because they don't look very nice, but that they are producing his most fascinating finds. According to Peter Hammond, a designated green belt area of grassland to the west of the site is almost an ecological desert. This situation epitomises a typical situation; i.e., that "greenfield sites" often have far less habitat value than their brownfield counterparts.

The only relatively happy aspect to this case is that there seems to be some scope for mitigating the effects of the future development. English Nature is working with the new site owners with a view to redesigning the development so as to not to build on sensitive areas. Chris Gibson of EN is quoted as saying that the biological information is sufficient for the site to be designated as a Site of Special Scientific Interest, and that this may be done in due course. Also, a spokesman for the East of England Development Agency is quoted as saying that the Agency wishes the development to take place in a way that is sympathetic to the wildlife and may therefore be receptive to EN's hopes.





## **pesticide spill disaster in Lincolnshire, UK**

In past issues of *ICN*, we have mentioned the serious damage that is being done to aquatic invertebrates due to the spillage and dumping of synthetic pyrethroid pesticides into streams and rivers. In the UK, much of this has been linked to the use of these chemicals for sheep dips, in the place of organophosphates, which can be very harmful to the health of people using them.

There has recently been a severe incident which, although of industrial origin rather than being directly linked to sheep dips, highlights the extreme toxicity of synthetic pyrethroids to aquatic invertebrates. It has been reported in a press release, which appeared in "Chemistry in Britain" (News Review, Vol. 4, April 2003). This states that: "A chemical spill has wiped out all of the aquatic life along a 21 m stretch of the River Slea in Lincolnshire recently." This was investigated by the Environment Agency for England and Wales (EA) who have "linked the disaster in the Slea to the release of cypermethrin, an insecticide acutely toxic to aquatic life – from an industrial site in Easington, Lincolnshire."

Cypermethrin is a chlorinated synthetic pyrethroid insecticide which has broad spectrum activity against a variety of insect crop pests including weevils, sawflies, aphids and planthoppers, and moderate mammalian toxicity (Cremlyn, *Agrochemicals – Preparation and Mode of Action*, 396 pp. John Wiley, 1991). The EA proposes to take official action against the company responsible for the incident.

## **San Diego Fairy Shrimp in California**

The last issue of *ICN* carried an item about an endangered fly in California (the Delhi Sands Flower-loving fly), which highlighted the conflicts between commercial land development and the USA's Endangered Species Act. In another item, we mentioned attempts to repeal certain provisions of the Act, so that military lands would be exempted. Both these issues are relevant to another case that is now merging; that of the San Diego Fairy Shrimp *Branchinecta sandiegonensis*. Like the Fairy shrimp that is on the UK's "Schedule 5" list (*Chirocephalus diaphanus*), *B. sandiegonensis* depends on seasonal pools. It is endangered because, according to a press release in April, more than 90 percent of the vernal pool habitat in southern California has been damaged or destroyed.

Under the provisions of the Endangered Species Act, the U.S. Fish and Wildlife Service (FSW) proposed the designation of an area of



critical habitat for this species, but the proposal was challenged by developers and also by military authorities, who cited national security considerations as a reason for excluding active training areas on the Marine Corps Base at Camp Pendleton. It seems that these lands are covered by approved "Integrated Natural Resource Management Plans", and are therefore excluded from the provisions of the Act, even without the broad exemption of defence lands that the Bush administration is now pushing forward.

In April of this year, the FWS issued a revised proposal to designate 6,098 acres (2,470 ha) of critical habitat, including vernal pools that support the endangered shrimp in California's Orange and San Diego counties. Steve Thompson, manager of the Service's California/Nevada Operations Office is quoted as saying that the decision to exempt certain lands from the designation of critical habitat will not result in the extinction of *B. sandiegonensis*. He added that the FSW had relied on the "cumulative scientific and commercial information available to us" in preparing this proposal. Also, he said that his office was actively soliciting public review and comment on all aspects of the proposed ruling.

A more critical comment came from David Hogan, Urban Wildlands Coordinator for the Center for Biological Diversity and original petitioner for the protection of the species under the Endangered Species Act. He is quoted as saying... "This may provide a small level of protection, but the proposal really points more to the Bush administration's assault on the environment because it excludes so many important vernal pool areas."



## RESEARCH NOTES

### Insects thrive on GM "pest-killing" crops

This was the title of an article by Geoffrey Lean in "The Independent on Sunday" on 30th March 2003. It refers to some research that was stimulated by questions about the resistance of pest insects to crops that have been genetically engineered to produce the toxin derived from the bacterium *Bacillus thuringiensis* (Bt toxin). It is not currently legal to grow GM crops in EU countries, except within official trials, but





they are widely grown elsewhere. The worldwide planting of Bt-engineered crops is said to have increased from 1.7 million ha in 1996 to 44.2 million ha in 2000 and is expected to increase further to give a global market of US\$25 billion (£15 billion) in 2010.

The research was done by workers at Imperial College in the UK and the Simon Rodriguez University in Caracas, Venezuela. (Ali H. Sayyed, Hugo Cerda and Denis J. Wright). Writing in "Ecology Letters" (Vol. 6: 157-169, 2003 – Blackwell Publishing Ltd/CNRS), they reported testing larvae of some Bt-resistant populations of the Diamond-back moth *Plutella xylostella*, so as to see whether the moth may be able to use the crystalline toxin (Cry1Ac) derived from Bt as a supplementary food protein.

The researchers were interested in the possibility that natural selection could result in the emergence of pests with the ability to thrive on genetically engineered food crops (GMOs), which produce their own Bt toxin. Previous work had already identified Bt-resistant strains of various pest insects, but some of these were known to have genetic disadvantages which would limit their success. There was, however, also some evidence that the larvae of a certain Bt-resistant strain of *P. xylostella* could actually utilise the Bt toxin as a supplementary food protein, thus achieving an enhanced growth rate.

The tests involved feeding a re-selected strain of Bt-resistant larvae with cabbage leaf discs which had been sprayed with suspensions of the toxin. Unsprayed leaf discs served as "controls". (There were additional "controls", involving Bt-susceptible larvae and larvae from a Bt-resistant source which had not been re-selected.) When the re-selected Bt-resistant larvae were fed on the treated leaf discs, they took less time to develop to the pupal stage than when fed on untreated discs. They also weighed more at the pupal stage. Overall, the data presented a 56% enhancement of growth rate as a result of feeding on the Bt-toxin-treated discs.

Quite apart from any environmental concerns about GMOs, one of the concerns of farmers is that the widespread use of GMOs with "built-in pesticides" will favour the emergence of resistant pests. The same problem is of course well known in conventional crops which are sprayed with pesticides. Critics of GM technology argue, however, that resistance is more likely to emerge if the pests are constantly exposed to toxins within the plants, rather than being periodically sprayed.

The ability of some strains of Diamond-back moth to grow faster on leaves treated with Bt-toxin goes a stage beyond mere resistance to the



toxin. The researchers believe that the toxin was either serving as an extra protein source, or that it was more subtly enabling the larvae to digest the leaf tissue. Either way, the result in the field could be an overall increase in the populations of pest species, with serious consequences for growers of both GMO and conventional crops. It is, however, not very surprising to find that a toxin can be used as a food source. It has long been known that some of the toxins naturally present in various plant species can be used as food sources by insects which are specialised feeders on such plants.



## LETTERS

*An open letter to various individuals and organisations from Dr Peter Sutton:*

Dear All,

For those who may be interested... an extract from a forthcoming British Wildlife article.

I fear that Scottish Parliament's decision to use internationally threatened habitat as a receptacle for society's rubbish will come back to haunt them!

Regards,  
Peter Sutton

....Finally, and with the greatest regret, I must announce that the Scottish Parliament has taken the decision to allow the continued destruction of internationally threatened habitat at Auchennines Moss in Scotland. This decision, in the words of a Scottish Wildlife Trust press release (07/04/03): "looks almost certain to consign the Bog Bush-cricket to Scotland's wildlife dustbin." The press release also states that the Minister for Social Justice, Margaret Curran, who was responsible for approving the development plans (which will allow Shanks plc to extend a landfill site onto the area) "has envisaged catching and moving the crickets to land further south and creating heathland." Unfortunately, this course of action, which appears to be a token effort to appease protagonists, misses the point by a considerable margin. This is not about





ting to protect a single species of nationally scarce invertebrate from commercial development. It is about attempting to preserve the unique assemblage of species (including internationally threatened vertebrates and invertebrates which are supposed to be protected by European legislation) that are present within this area of outstanding biodiversity.

Sadly, it appears that in spite of the entire post-Rio Earth Summit global conservation effort, (and bearing in mind that we are currently sending millions of pounds trying to recreate both heathland and wetland habitats) we are consistently incapable of learning one simple and fundamental lesson. The best way to preserve the unique species assemblages that still exist in our remaining rare and threatened habitats, is not to destroy them in the first place.



## FUTURE UK MEETINGS

### FUTURE UK MEETINGS

There is a small selection from local invertebrate meetings in Britain, intended to take place after publication of this issue of *ICN*. Although non-members of the organisations concerned are likely to be welcome in almost all cases, they should always first check with the leader or the named contact person.

#### **oucestershire Invertebrate Group**

- Wednesday 23rd July: Ashleworth Ham Reserves (evening). Meet at 19.00 at the hide (SO 827264). Contact: Rosie Cliffe at Glos. Wildlife Trust (01452 383333)
- Sunday 10th August: Selsey and Rodborough Commons. Meet at 10.30 in the car park on top of Selsey Common (SO 828027). Contact: Guy Meredith (012424 524138)

#### **Surrey Wildlife Trust**

- Friday 18th July: (evening): Riddlesdown. Meet at 21.45 at the end of Honister Heights, Purley, near Riddlesdown School. Bring torches. (TQ 332602). Contact: Malcolm Jennings (0208 684 4000)

#### **London Wildlife Trust**

- Saturday 19th July: Harrow Common. Meet at 10.30 at Stanmore Common car park, Warren Lane, HA7. Transport: Buses 142, 258. Contact: John Dobson (0208 907 5181)

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### NOTICE

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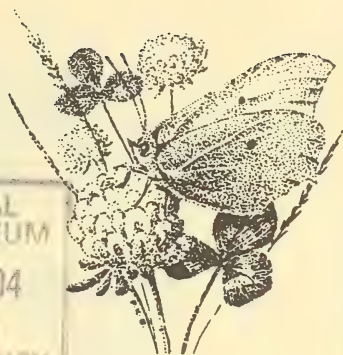
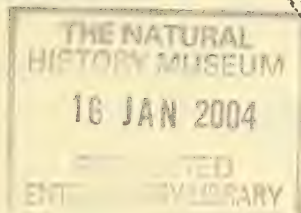
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## EDITORIAL

As this issue of *ICN* goes to press, those of us who live in southern England are experiencing the first autumn chill after a hot dry summer, which was certainly good for some kinds of invertebrate (e.g. butterflies) if by no means for all. Fluctuations in populations will, however, always occur and so we need to look at long-term trends to see whether we are winning or losing in our cause of invertebrate conservation.

Global warming is one trend which researchers overwhelmingly believe is very real, even if they disagree about its causes. In countries like the UK, which normally have fairly cool summers, increasing temperatures may favour invertebrate species which thrive best in more continental or Mediterranean climates. Indeed, some such species are clearly extending their ranges into higher latitudes and elevations. The converse is, however, probably true for cold-climate species which are just as much on the edges of their ranges in the middle latitudes.

Sadly, the dominant trend in many western countries is the continuing loss and fragmentation of habitats due to intensified agriculture and increasing urbanisation and road construction. These factors are also at work elsewhere in the world, together with deforestation, uncontrolled industrialisation and destructive fishery operations. In this apparently depressing situation, we might suppose that the most realistic aim is to slow down the rate of habitat-attrition somewhat. On the other hand, we can adopt the attitude that 'problems' should be regarded as 'challenges' and indeed 'opportunities'. Thus, while doing all we can to stem the tide of damage to existing habitats, we can also aim to re-enrich some of the vast areas of the world that have become biologically impoverished due to human activities.



In some cases, re-enrichment is already happening and is supported by the policies of governments and their statutory agencies. One example concerns the extensive planting of exotic conifers during much of the 20th century in the UK, which resulted in a loss of habitats associated with the previous woodland, grassland, heathland or moorland. The biodiversity of planted forests is, however, now increasing for various reasons. The selective harvesting and replanting of different forest blocks in the course of economic management is providing a more diverse age-structure. Moreover, this process is being enhanced by the enthusiastic implementation of official policies for multiple land-use, including conservation. Invertebrates are already benefiting and the opportunity exists to influence management practices even more in this direction.

Changes in agricultural practices within the European Union may still be on an adverse course, compared with forestry in the UK, but this is being countered to some extent by the continuing adoption of agri-environment schemes. A dialogue between invertebrate organisations, government agencies and farmers could help to develop these schemes so as to make them work better for habitat regeneration. Also, changes in the system of agricultural subsidies are beginning to reduce some of the adverse effects of intensification. In particular, subsidies based on the area of grazing land, rather than on the number of sheep or cattle, are making it less economically attractive to over-graze or to apply excessive amounts of fertiliser.

One of the toughest challenges is to reverse some of the damage that has been done to river systems. In the interests of agriculture and urban or industrial development, most sizeable rivers in developed countries have been greatly modified by drainage schemes, flood control and various measures to prevent them from naturally changing their courses within flood plains. Not only has such interference greatly damaged riparian habitats; it has often failed to protect areas from flooding and has sometimes exacerbated the problem. A number of small-scale restoration schemes in the UK and some larger ones in the Netherlands have shown that wildlife can benefit greatly from a return to more natural riparian conditions. The focus has, however, been mainly on vertebrates and so there is an opportunity for invertebrate organisations to get involved and to help in campaigning for more restoration schemes.

Another problem which deserves a radical solution is the intensive re-development of so-called brownfield land in the UK and other countries. Such land includes not only derelict industrial sites but also





large gardens in residential areas that are often being re-developed so as to achieve higher housing densities. As the trend is very much an inverse one, we need to do something more than to campaign for the protection of certain brownfield sites (or small corners of others). One possibility is to create habitats within municipal parks, which often consist mainly of formal areas of mown grass, flowerbeds, and 'lollipop' trees. There could thus be benefits not only for invertebrates, but also for local people (especially budding biologists amongst the young) and for the budgets of park managers.



## NEWS, VIEWS AND GENERAL INFORMATION

### **Ragwort: poisonous plant and invertebrate habitat**

In England, concern about alleged cases of ragwort (*Senecio jacobaea*) poisoning amongst horses and other livestock has led to the passage of a new Bill through parliament and the drafting of an associated code of practice. If the Bill were to become law, civil action could be taken against anyone failing to comply with the code's provisions for controlling ragwort near land used for grazing or for fodder crops. Although there is clearly a need to prevent ragwort poisoning, which is a very unpleasant and eventually fatal condition, conservation bodies have been concerned about the potentially adverse effects that an over-zealous control campaign would have on the invertebrates dependent on ragwort. There are about thirty species in the UK which depend either exclusively or predominantly on ragwort and a great many others which use it either as one of their foodplants or as a pollen or nectar source.

Through Wildlife and Countryside Link, several conservation bodies have expressed their concerns in response to a government consultation exercise. The AES has sent its own comments and has also contacted Peter Ainsworth MP, a Board Member of Plantlife, which has now challenged the claim that a serious problem exists.

The AES submission to the government consisted of a point-by-point commentary on the draft code and also some general comments (with contributions from Alan Stubbs of Buglife). The key points were (1) the importance of ragwort for biodiversity (2) a critique of the claimed incidence of ragwort poisoning of horses and ponies and (3) the



options for moderate control measures. Our comments on biodiversity are shown below, with information provided by Alan Stubbs of Buglife – The Invertebrate Conservation Trust.

“Common ragwort is highly important for maintaining the biodiversity of invertebrates, as has been emphasised by English Nature and acknowledged within the draft code. Conservation of the ragwort fauna is part of government policy in the form of the Biodiversity Action Plan, including Local Action Plans, even though the plant is classified as a noxious weed. We draw attention to the following key points regarding the fauna of ragwort:

- a) Thirty species of invertebrate depend on it as their sole foodplant (a fact that has not been emphasised sufficiently).
- b) It is important for at least 26 other herbivorous species, especially in districts where their alternative foodplants are absent or scarce.
- c) Among the many insects for which it is a pollen and nectar source, there are about 30 species of solitary bee, for which it is especially important in the absence of appropriate alternative flowers. Survival or extinction may hinge on availability of ragwort flowers under these circumstances.
- d) Some of the specialist ragwort-feeding insect species are designated in the Red data Book as ‘Rare’ or ‘Scarce’ and others are ‘Local’.
- e) Reasonable amounts of ragwort are needed for sustaining ragwort-dependent species; neither a few token plants, nor an excessive amount which could pose a risk to livestock.”

### **Brownfields, wasted land or Phoenix sites?**

Following the whole-page coverage of Northwick Road, Canvey Island in the UK national press (see *ICN* 41), we might have expected that brownfield biodiversity would begin to earn a little more awareness within the world of journalism. Apparently not, judging by a recent campaign on ‘wasted land’ that has been promoted by the BBC in conjunction with other organisations. Members of the public have been encouraged to visit the website of the Commission for Architecture and the Built Environment (CABE), so as to log information about their worst local examples of wasted land. The trouble is that people have been led to think that they should be suggesting that such land should





built on or turned into formal play areas and other conventional amenities. There seems to have been no glimmer of awareness that the wildlife of many wasteland sites is a wonderful resource for the enjoyment and education of local people.

Pictures of some of the nominated sites have been posted on the ABE website just to show how dreadful they look. The pictures dominated by man-made structures in various states of dilapidation are indeed eyesores, but some show apparently good habitat. For example, the site of a former school in Salford is said to be a weed-infested mesore and yet shows a varied grass sward, mixed with scrub, and might arguably be visually attractive even to a non-naturalist who might merely wish to see some informal greenery amidst what can euphemistically be called the built environment.

It is a shame that the CABI and BBC campaign has been unbalanced, as many sites have scope to provide both formal and informal resources for people of all ages, as well as for wildlife. Unfortunately, attempts to persuade the BBC to redress the balance seem to be falling on deaf ears, but Matt Shardlow of 'Buglife' circulated an e-mail message to encourage those of us with an interest in the wildlife of 'wastelands' to influence the outcome of the campaign. Matt's message may have become out-of-date with regard to the campaign by the time that this issue of *ICN* appears, but it is well worth reiterating and is reproduced as follows.

"The issue of conserving the species of invertebrates that are now largely restricted to 'brownfield sites' is one of the most important and urgent issues facing wildlife conservation in the UK. Buglife is campaigning for a change in priorities and a greater understanding of the biodiversity conservation issues associated with sites that some may view as 'waste land'. Buglife has recently been successful in encouraging English Nature to initiate a review of its SSSI designation guidelines that we hope will address the lack of formal protection available to such sites.

"In the Government's Planning Policy Guidance 3 (Housing) it clearly says that 'previously developed land' (the technical term applied for brownfield sites) clearly excludes land that has 'blended into the landscape in the process of time' or where the 'contribution to nature conservation' ... 'could outweigh the re-use of the site'. This wording is supported in law (*Dodd vs. SoS Transport Environment and Regions* 2002). Strangely, therefore, land that has been previously developed but is now critically important for wildlife is not 'previously developed'! Calling such sites 'previously developed' or 'brownfield' (or indeed



wasteland!) causes confusion. Thus, to discern them from sites where development as houses or business parks is the expected end-point, we suggest that they should be called Phoenix sites.

"In the short term there are three obvious ways that we can all help:-

1. vote for Northwick Road on the CAGE website - this flagship campaign will raise the issue in the minds of decision makers.
2. identify your local 'Phoenix' sites, convince your local EN, CCW, EHS or SNH office how important each site is and petition the local council to include the site in the 'greenfield' category rather than the 'brownfield' category in the Local Plan (best done when the Local Plan is reviewed).
3. visit [www.buglife.org.uk](http://www.buglife.org.uk) and join the organisation; if enough people become friends of Buglife we will be able to continue working on this and other issues affecting invertebrate conservation."



## SITES AND SPECIES OF INTEREST

### Designation of protected sites in Wales

In *ICN 41*, we extracted some information from a report by Adrian Fowles of the Countryside Council for Wales (CCW), submitted to Invertebrate Link for the period April 2001 to March 2002. As promised, we are now including some information from his subsequent report for 2002-03 (during which CCW spent over £120,000 on invertebrates).

In addition to its continuing work on the notification of candidate Special Areas of Conservation (cSACs), CCW is identifying some species and habitats are being identified for special treatment under the Countryside and Rights of Way Act, whereby they be given priority as if they were covered by the UK Biodiversity Action Plan (BAP). Two species, which represent habitats not otherwise covered by BAP, were accepted for such treatment during the year. These were the Welsh Clearwing *Synanthedon scoliaeformis* and the Brown Hairstreak *Thecla betulae*, respectively representing mature birchwoods and blackthorn hedgerows. Following its rediscovery in Wales in 1988, the Welsh Clearwing was known from three sites in north Wales but surveys carried out under Species Challenge Funding revealed a much denser distribution covering 27 tetrads in the same general area. However,





most of the new localities are represented by small numbers of edgerow birch trees and very few new strong populations were discovered.

Among the species which already have UK BAP Priority status, the Belted Beauty *Lycia zonaria britannica* was the subject of a translocation project involving the introduction of c. 1000 larvae to a new site on the North Wales coast, with further releases intended. Adrian Fowles points out that this is not a practice normally favoured by CCW, but that it was necessary in this instance because of the threats to the donor site.

As mentioned in various issues of *ICN*, the White-clawed Crayfish *Austropotamobius pallipes* has disappeared from many English watercourses due partly to the disease crayfish plague, which is carried by alien crayfish that have escaped into the wild. It is therefore encouraging that, according to Adrian's report, a total of 44 crayfish were recorded in a survey at twelve out of 110 stations on five of the 16 rivers/brooks sampled. Comparing these results with those of a similar survey in 1995, it seems that the species is still widespread in the mid-Wye catchment, although it may have been lost from some tributaries and numbers may have been reduced on others as a consequence of fertiliser run-off, siltation and perhaps synthetic pyrethroid leakage from sheep dip stations. Alien crayfish were not found and plague was not recorded.

Despite the relative stability of the mid-Wye crayfish populations, CCW has been concerned about recent declines in one of the Wye tributaries, the Afon Edw. This river had arguably been the most important tributary of the River Wye for crayfish. A CCW/University of Cardiff survey of possible causes of the decline has provided preliminary evidence that excessive siltation may be a factor, whereby there is a loss of interstitial habitat on the river bed and hence of resting places which crayfish need in order to escape predation, particularly in their immature stages. In the interests of the salmon fishery, there have already been attempts to exclude livestock from the river banks so as to reduce siltation, but this does not seem to have solved the problem.

The many other species being studied or surveyed by CCW or under CCW funding include the following: the spider *Agroeca lusatica* at Anyslas Dunes in Cardiganshire; the weevil *Procas granulicollis* in Powys; the Bog Ant *Formica candida* on Cors Goch Llanllwch National Nature Reserve, the stonefly *Brachyptera putata* in the River Usk, the Orange Upperwing *Jodia croceago* in Cardiganshire and the Noble



Chafer *Gnorimus nobilis* in the orchards of Gwent. Other work is focussed on assemblages of species and includes important invertebrate biotopes such as soft cliffs (at selected sites throughout Wales) and exposed riverine sediments. These sediments are being studied in relation to the population dynamics of beetle assemblages and the effects on these species of the disturbance of gravel patches.

### **Whitehawk Hill, Sussex, SE England: another outstanding urban fringe site**

As has often been claimed in *ICN*, invertebrate habitats are seriously threatened by the inappropriate designation of land as fit for development. The trouble is that politicians and planners understandably wish to put land into neat compartments, according to its current or proposed use. The threat in SE England is now greater than ever, as current government guidelines for housing density leave very little room for green space within new developments. Sometimes, however, sites with exceptional wildlife value (e.g. the Canvey Island sites mentioned in *ICN 41*) can be saved at the last minute if new evidence emerges.

Whitehawk Hill, although on the urban fringe of the coastal city of Brighton has partial protection under "Downland Land Use Policies". It was, however, partly excluded from the proposed South Downs National Park, and thus from special planning controls which will aim to safeguard and enhance amenity and wildlife conservation. National Park status is helpful in many ways, but it is a very blunt instrument, allowing large areas of intensively managed farmland with poor biodiversity to be better protected from development than much richer sites which happen to lie outside the Park boundary.

The "Friends of Whitehawk Hill" (FoWH), have been campaigning for the full inclusion of the area (together with the nearby Sheepcote Valley) within the Park boundary. They have recently gained City Council support, the group points out that ... "much urban fringe downland is more biologically intact, and is more loved and used by local people, than more remote areas, whose inclusion in the National Park no-one questions. Sites such as Whitehawk Hill and the Sheepcote Valley, and Newhaven Cliffs, are extraordinarily rich in wildlife, history & prehistory, and contain some of the most dramatic and exhilarating landscapes on the whole long Downland chain."

The true value of informal nature reserves is summed up by Fred Netley, a local historian and community activist, commenting on the





recent discovery of a beetle new to the UK (see below). He is quoted as follows: "Having lived in the area for over 60 years and played on Whitehawk Hill as a child, I have always thought that it was a unique place. A great deal of our play as youngsters involved the rich wildlife that has always been present on this great piece of downland, so the discovery of the Whitehawk Soldier Beetle is an exciting event to me. I certainly believe that it deserves to take its place along with all the other marvellous things contained within the rich natural and social history of Whitehawk Hill and the surrounding community."

The beetle mentioned in Fred Netley's statement is one of many interesting species to which the Friends drew attention via a press release in June 2003. They mentioned some extraordinary biological records that local people and specialist recorders have begun to gather in recent years. These include the discovery of 24 nationally scarce or endangered species of insect within one small section of the Hill outside the proposed Park boundary. Also, 13 scarce or rare plant species have been discovered on the Hill in recent years. Of these, eight are found only in areas not recommended by the Brighton City Council for inclusion in the National Park.

There has already been the threat of a housing development (currently withdrawn) on part of Whitehawk Hill, and it is interesting that this very site (Wilson Avenue) is the habitat of the new UK record of a beetle. This is a cantharid or soldier beetle, *Malthodes lobatus* (Kies.), which Maxwell Barclay (of the Natural History Museum, London) collected by vacuum sampler in July 2002. Maxwell realised that it was unusual, because the specimens (all adult females) were exceptionally small (around 1.5 mm long) and soft-bodied, with very reduced elytra. He provisionally recorded them as being similar to a known British species, *Malthodes umilis* Breb. Several months later, however, a German visitor to the Natural History Museum, A. Kopetz, immediately identified the specimens as *M. lobatus*, being familiar with this species in continental Europe. He and Maxwell have co-authored a paper in "The Coleopterist", a pre-print copy of which was kindly made available to ICN.

Maxwell notes that the locality where he discovered *M. lobatus* is rabbit-grazed and supports a characteristic downland flora and fauna, which includes several Nationally Scarce beetles which he also recorded. There are also ancient hedgerows, which add considerably to the interest of the site, and which Maxwell presumes provide the dead wood necessary for the larvae of the *M. lobatus*. However, part of the threatened site has 'brownfield' characteristics, consisting of former allotments now somewhat overgrown with nettles, willowherb, brambles etc.



The beetles which Maxwell or two other entomologists, Peter Hodge and Warren Cresswell, have recorded at the proposed development site include the following that are listed as having Red Data Book or other conservation status: *Panagaeus bipustulatus* (Carabidae), *Athous campyloides* (Elateridae), *Drilus flavescens* (Drilidae), *Scymnus schmidtii* (Coccinellidae), *Scaphidema metallicum* (Tenebrionidae), *Meligethes rotundicollis* (Nitidulidae), *Longitarsus dorsalis* (Chrysomelidae), *Gymnetron melanarium*, *Zaclarus exiguus* and *Ceutorhynchus quercicola* (Curculionidae). Two other interesting chrysomelid beetles are *Atica carinthiaca*, a recent addition to the UK list with unknown status and *Bruchidius varius*, a recent colonist.

Among the site's Diptera (two-winged flies), those with some form of conservation listing include the Hornet Robber Fly *Asilus crabroniformis*, (Asilidae) a Biodiversity Action Plan priority species, the tachinid *Zophomyia temula* and the tephritids *Icterica westermanni* and *Urophora cuspidata*. Other scarce, notable or Red Data Book insects include a lacewing *Nothochrysa capitata* (Chrysopidae) and several Hymenoptera: *Bombus (Psithyrus) rupestris* (Apidae), *Philanthus triangulum* (Sphecidae), *Mutilla europaea* (Mutillidae) and *Melitta tricincta* (Melittidae). There are also strong populations of the vertebrates Slowworm *Anguis fragilis* (Anguidae) and Common Lizard *Lacerta vivipara* (Lacertidae).

The local campaigners point out that urban fringe sites have been accorded an undeservedly low status by policy makers and that their wildlife has often been under-recorded. Also, despite often being intensively used by local people, they tend for societal reasons to lack voluble advocates. Anyone who could help the campaign should contact Mr. Dave Bangs, Secretary, FoWH (tel. 01273 620815).

## **A major but understated river pollution incident in eastern England**

On 3rd July, Matt Shardlow of Buglife – The Invertebrate Conservation Trust circulated an e-mail message drawing attention to a major pollution incident on the River Nene in eastern England. He was referring to a press release that had recently been put out by the Environment Agency (EA) stating... "We have perhaps been fortunate that, on this occasion, the pollution did not have a more severe impact on river life". Matt wrote as follows....

"What you might not determine from the press release is that 90-100% of the insects and crustaceans have been killed on a 88 km



etch of the river between Northampton and Peterborough and probably downstream. This seems to have happened in February and there are no indications of recovery yet! As 98% of animal species are invertebrates it is Buglife's view that this is indeed a severe impact and one of the biggest of its kind [in the UK]. The knock-on effects on fish (lack of food) and plants (reduced grazing of algae) are as yet unknown, although there has been an unusual increase in blue-green algae. Molluscs, worms and flatworms are unaffected and may be able to compensate for some of the loss of arthropods. While the cause is unknown, it would seem likely that insecticides were involved; perhaps one of the pyrethroids, which are used in sheep dips and have been implicated in similar incidents. Buglife is very concerned on four points:-

There is accumulating evidence that populations of riverfly (mayflies, caddisflies and stoneflies) are in decline across the UK (for more information see [http://www.buglife.org.uk/html/project\\_riverfly.htm](http://www.buglife.org.uk/html/project_riverfly.htm)).

One of the factors in the riverfly decline may be an increased frequency of catastrophic pollution events such as this one.

Invertebrates are essential to the maintenance of riverine ecosystems and water quality: their loss can have a profound effect on the system.

The river was home to the Red Data Book riffle beetle *Stenelmis canaliculata* which may now be extinct on the river."

Matt has acknowledged that, by July, the EA was working hard to discover what had happened, but he asks why it took four months for this incident to be discovered. Elliot Morley, Environment Minister, responded by defending the EA, but without referring to specific invertebrate issues.

### **Mayfly re-establishment after pollution of the River Wey, S. England**

As reported in a recent issue of the English Nature magazine "Envisage", a mayfly translocation project followed a pollution incident which wiped out invertebrate populations on part of the River Wey in Hampshire. Dr Cyril Bennett, who was in charge of the project, has kindly provided some details about this. Thanks are due also to Amanda Craig of English Nature, who provided additional information.





The pollution incident, which killed most of the invertebrates on several miles of the river Wey, occurred in May 2002 and appears to have been due to an insecticide which entered the river via the sewage treatment works at Bordon. There was particular concern about the mayfly *Ephemera danica*, which is of major importance as a food source for the river's fish population, as well as being an important component of the fauna in its own right. Dr. Bennett has explained that, although most aquatic invertebrates will generally recover from downstream drift from above the pollution source, *E. danica* is a burrowing mayfly and therefore does not generally drift. When this species is lost from a section of river it is not easy for it to recover.

As there were doubts about the ability of the *E. danica* population to recover, English Nature issued a licence to allow the removal of eggs (around 4-5 million) from the River Test, which is a Site of Special Scientific Interest. Eggs were transferred to sites on the River Wey in early June 2003 and successfully hatched. Soon after the release, however, there was a further pollution incident, on which occasion the insecticide was identified as Chlorpyrifos. This second 'hit' killed well over a million of the newly hatched mayfly larvae, which had been placed only a short distance below the sewage treatment works. It was, however, hoped that others, which had been placed several miles downstream, would have survived; this was due to have been ascertained by an autumn invertebrate survey, by which time the larvae should have reached 4-5mm in length. Unfortunately, another batch of several million larvae that were being experimentally reared may also have been lost due to an overheating problem with the submersible pumps at the rearing site; an artificial stream in the field centre at Leckford, Hampshire. Replacement of the pumps with an external kind will have taken place before further rearing trials.

As mentioned in the preceding article, Buglife holds evidence that stoneflies and caddisflies (as well as mayflies) are in decline across the UK, perhaps due in part to pollution incidents. Dr. Bennett confirms that angling clubs across the country are reporting such declines and that pollution incidents are a likely contributory factor. Considering that the River Nene incident went undocumented for four months, there is reason to suspect that many small-scale incidents go undetected. Such cases occur, for example when spillages or overflows from sheep dips enter small streams (see ICN 27).





## LETTERS

### From Craig Macadam

*Ephemeroptera Recording Scheme, c/o Craig Macadam, Bradan Awasurveys Ltd., 109 Johnston Avenue, Stenhousemuir, LARBERT FK5 4JY*  
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I thought you might be interested in a little update on *Brachyptera putata* (as featured in *ICN* No. 40 (February 2003)).

I have been collecting samples from two sites on the River Don near Dce, Aberdeenshire for the past year, and in February I found a single specimen of *Brachyptera putata* at each of my sites. In the article in *ICN* it was also noted that the Don was poor for stoneflies, but over the past eight months I have recorded nine species of stonefly from my sites on the Don.

As with many aquatic insects, there is some dubiety over the taxonomy of *Brachyptera putata* and, in turn, its endemic status. *Brachyptera putata* was recorded in the Carpathian Mountains, Rmania in the early part of the 20th century but it was subsequently decided that these records were in fact *B. starmachi* Sowa, 1966; a species new to science. This separation was, however, based solely upon details in literature, rather than by comparison of specimens. I suspect that we may find out that we have a situation similar to that of *Rabdipteryx anglica*, which is the same as *Rb. acuminata*, and which also has a distribution centred on the Carpathians. The only way to clear up this dubiety would be to collect adult specimens of *B. putata* to compare with *B. starmachi*. I have access to specimens of *B. starmachi*, but larval specimens *B. putata* seem to be few and far between at the best of times so finding an adult is proving rather difficult! I will probably either place a malaise trap alongside the river during the flight period next year or try to rear the larvae through to adulthood. However, I'm not sure how resilient *B. putata* is to laboratory rearing.

## FUTURE UK MEETINGS

### Invertebrate Link national conference: Peterborough

This postponed conference has been retimed for Saturday 3rd April 2004 at Peterborough library. InvLink contact: Dr N. Bourn, BC, Manor 3rd, East Lulworth, WAREHAM, Dorset, BH20 5QP (tel. 01929 400209).

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### NOTICE

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# INVERTEBRATE CONSERVATION NEWS



No. 43, February 2004

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## EDITORIAL

At a field meeting in southern England last May, the site owner showed entomologists many decaying tree stumps and logs which had been dismantled to the point where they were no longer providing any substantial deadwood habitat. The culprits were not unscrupulous entomologists; they were badgers *Meles meles*, searching for invertebrate food. Such has been the intensity of their activity on the site that the owner, an award-winner in woodland conservation, is convinced that the deadwood habitat is being seriously depleted. Although this is a natural process, it is not counter-balanced by any natural control of badgers, as may have happened in Britain before people exterminated large predators.

Those of us who seek to maintain a rational basis for wildlife law as it applies to invertebrates have, perhaps wisely, generally avoided commenting on the rights and wrongs of laws that specifically protect vertebrates, of which the Badgers Act (1992) is an example. For invertebrates, we have emphasised the need for the law to be based on sound ecological principles and not to impinge on the collection of species in any way that is not necessary for their conservation. We have also emphasised how important it is for people to have the freedom to study invertebrates and thus often to provide information which is very valuable for conservation.

With relatively few exceptions, the law protecting invertebrates in the UK reflects this reasoned and principled approach. Some people have, however, suggested that invertebrates should be reverse-listed for legal protection, similarly to UK birds. It would then become a criminal offence to collect or intentionally kill any invertebrate unless the law stated that the species concerned was unprotected (e.g. because of





designation as a pest). While trying as usual not to meddle in the affairs of our fellow naturalists whose interests lie mainly with vertebrates, we should perhaps permit ourselves to ask whether both we and they should apply the same underlying principles.

As far as conservation is concerned, a general concept is that the taking or killing of specimens is most likely to affect the population status of species whose body size is relatively large, whose offspring are few and whose populations are relatively small (i.e. many vertebrates). In contrast, most invertebrates are small species with high fecundity and large populations. This 'greater investment in the individual' may be reason enough for vertebrates to be protected more strictly than invertebrates, but there are other reasons unrelated to conservation that may also be considered; i.e. animal welfare and cruelty. Welfare should not be ignored as far as invertebrates are concerned but it is regarded as much more of an issue in relation to mammals and birds, especially those species which have entered the public imagination through the revelation of intelligent and endearing behaviour. In the case of the badger, such considerations probably played a major part in the passing of the Badgers Act in the UK, together with abhorrence of the cruel practice of badger baiting. It should, however, be remembered that such protection is not accorded to other species which, despite being intelligent and capable of feeling pain (e.g. rats *Rattus* spp.), are less esteemed in the human scheme of things.

There is often a very unhelpful blurring of the distinct objectives of conservation and animal welfare. In fulfilment of either or both these objectives, a species may deserve legal protection, but perhaps by means of different measures. In the case of the badger, current UK populations are not in need of conservation, but perhaps they could eventually become so in the absence of any protection. Welfare is another consideration, but not one that necessarily applies more to badgers than to other warm-blooded vertebrates. It is perhaps considered most in relation to field sports (including hunting for human food) and pest control. To some extent, laws controlling these activities reflect a moral premise that wild animals should not be killed without good reason or just for fun, irrespective of any implications for the welfare or conservation of the target species.

The need for controlling badgers is of course debated a great deal and with much passion in the context of their alleged role as a reservoir of bovine tuberculosis. The damage that uncontrolled badger populations may be doing to invertebrate habitats and populations is



almost never spoken of, but perhaps we should at least be making a case for some research to be done. There is perhaps a parallel here with the concern that some of us have about the predation of invertebrates by artificially boosted populations of birds, supposedly in the name of wildlife conservation. The only thing that can be said with certainty is that human beings have some rather mixed-up ideas underlying their desire to protect their fellow life forms.



## NEWS, VIEWS AND GENERAL INFORMATION

### **Ragwort: news about legislation in England**

In *ICN 42* we reported that conservation organisations, including the BCS and Buglife – The Invertebrate Conservation Trust, had submitted comments on proposed legislation for the control of ragwort (*Senecio jacobaea*) in England. There are serious concerns about any measures that could lead to excessive destruction of this plant, which is vital for about thirty UK invertebrate species and very important for a great many others, as discussed in our previous article. For a while, there were strong hopes that the legislation would be defeated, but it eventually became law and will eventually be implemented under a code of conduct, which has recently been open for consultation.

Under the code, the law will enable proceedings to be taken against occupiers of land who allow ragwort to grow within a defined distance from areas that are used for grazing or for the production of animal fodder (either 50 or 100 metres, depending on circumstances). One of our key suggestions was that these distances should be reduced (in line with scientific data about ragwort seed dispersal), so that not too huge part of England's land area would come under the provisions of the code. There were, however, opposing calls for the distances to be increased, rather than decreased, and it unfortunately looks as though the 50 m and 100 m limits will be kept as a perceived compromise. There is probably not much else than could be done to mitigate the potentially harmful effects of the code, although we can perhaps hope that there may be a favourable response to our suggestion that unsuitable wording (e.g. "infestation") should be changed.

With a 100 m-wide ragwort control zone around all areas used for grazing or for forage production, a vast area of land could be affected, but the actual impact of the Act and the code will need to be assessed



over a number of years. It seems likely that official bodies who manage land (especially local authorities and the Highways Authority) will try to comply with the code, rather than face the possibility of legal proceedings against them. In particular, roadside verges could be widely targeted. As far as the methods of control are concerned, the spraying of herbicides may be seen as the cheapest option for many sites. This is likely to affect many plant species in addition to ragwort.

To the uninitiated, the new Act may appear reasonable. It was drafted so as to address a perceived emotive problem; i.e. that ragwort was becoming more abundant and that there was a greatly increased incidence of ragwort poisoning amongst livestock, especially horses. Also, those responsible for drafting the legislation claimed to have taken full account of the importance of ragwort for wildlife. On closer scrutiny, however, the evidence for the alleged incidence of poisoning is very shaky and falls very far short of the quality of science-based evidence that is demanded in various other areas of legislation. As for the safeguards contained within the Act, these may to some extent help to prevent damage to habitats on nature reserves and other designated wildlife sites, but not within the wider countryside.



## SITES AND SPECIES OF INTEREST

### **Brooklands, Surrey, another threatened brownfield site in SE England**

David Baldock, co-ordinator for the Bees, Wasps and Ants Recording Society and a trustee of "Buglife", has kindly provided some information about the above site, which is famous as the world's first purpose-built motor racing circuit. He has found both from previous records and his own observations that the site is remarkable for its fauna of aculeate Hymenoptera. The following account is adapted from a report that David has sent to various interested parties following a threat of proposed development.

The Brooklands site covers approximately 200 hectares and the River Wey runs through the middle of it. In Victorian times Brooklands and surrounding land was open sandy country and heathland, but it is now





most completely built over, apart from St. George's Hill Golf Course which almost adjoins the site on the east and which still has a large area of heathland. Brooklands has no designated status for protection and is not even recognised as a Site of Nature Conservation Importance. The local Planning Authority is Elmbridge Borough Council.

The Brooklands motor racetrack was built in about 1904 and most of the embankments are still in existence. In about 1910 an airfield was built in the middle of the racetrack, and this was later developed into a very large aircraft factory with a very long tarmac airstrip and perimeter roads, all of which remain. About half the area within the racetrack has been developed with factories, offices, and housing estates. The vegetation type is dry acid grassland with a flora typical of open, slightly acid, sandy ground with bare patches, disturbed by rabbits, erosion and human activity such as motor-bike scrambling.

During 2003 the owners of the site, Daimler Chrysler, obtained outline planning consent to develop the site into a Heritage Technology Centre and Community Park. In David's view, the Environmental Impact Assessment (EIA), carried out in 2002, does not appear to have included a proper survey of invertebrates: only a very few butterflies and dragonflies are mentioned and no mention is made of the aculeate fauna. David writes that the aculeates nest in such large numbers in the acid grassland, especially in bare patches, that no entomologist could possibly fail to notice them. He adds that, unfortunately the EIA was never sent to Surrey Wildlife Trust last year when outline planning consent was applied for, even though the Trust had asked for a copy.

In Victorian and Edwardian times, the area around Byfleet and Weybridge, including Brooklands, was frequently visited by all the eminent hymenopterists of the day, who were able to travel there easily after the railway line from London to Woking was built. This locality became one of the most famous sites in the country for Hymenoptera, with many extreme rarities and species now with Red Data Book (RDB) status being collected there from 1850 to 1915 by Fred Smith of the British Museum, Edward Saunders and F.D. Morice from Woking and J.H. Mortimer who lived at Byfleet from about 1912 till 1915. Although much of the countryside of those days has been built on, the undeveloped land within the Brooklands site has probably changed little in the last 150 years. It seems likely that at least some of the rarities recorded by the early recorders could still be present on this dry acid grassland.



David Baldock's own records were all made during six short visits in 2003. He recorded eighty-six species of bees, wasps and ants, including one Biodiversity Action Plan species, *Cerceris quinquefasciata*, five other Red Data Book species and seven Nationally Scarce species. Most of these were species associated with dry, sandy soils. David has produced a full list of all the species that he recorded, but the following are the most notable:

**Wasps:** *C. quinquefasciata* (UKBAP Species and RDB3), a digger wasp not recorded in Surrey since 1894 and otherwise known in the UK only from a few other counties; *Smicromyrme rufipes* (Nationally Scarce Nb), *Hedychrum niemalai* (RDB3), a spectacularly beautiful jewel wasp, found commonly all over the site but elsewhere restricted to a few sites in southern England; *Oxybelus argentatus* (Nationally Scarce Na), a mainly coastal digger wasp, known elsewhere in Surrey only at Frensham Pond; *Oxybelus mandibularis* (Nationally Scarce Na), a digger wasp; *Philanthus triangulum* (RDB2—p RDB4—out of danger), the famous Bee Wolf, which has spread dramatically in the last 10 years.

**Bees:** *Hylaeus signatus* (Nationally Scarce Nb), a small black bee associated with wild *Reseda luteola* (a plant of disturbed ground); *Andrena argentata* (Nationally Scarce Na), a mining bee; *Andrena florea* (RDB3), a mining bee which collects pollen only from White bryony *Bryonia dioica* and is extremely rare outside Surrey and W. Sussex; *Dasypoda hirtipes* (Nationally Scarce Na), an impressive mining bee which was found at ragwort flowers at the site; *Heriades truncorum* (RDB3), a small black bee, which collects pollen mainly from ragwort and is virtually unknown outside Surrey and West Sussex; *Nomada baccata* (Nationally Scarce Na), a cleptoparasitic bee of the scarce mining bee *A. argentata*; *Nomada fulvicornis* (RDB3), a cleptoparasitic bee of *Andrena bimaculata* (a scarce mining bee).

David lists seven other aculeates (four RDB species and three Nationally Notable species) which seem very likely to be present at Brooklands on the basis of old or nearby records. He also refers to a list of beetles and bugs, including many rare species, which were collected by Dr. Jonty Denton on a single visit during 2003.

The site owners have made an application for full planning consent and this is likely to come before a planning committee as early as 24th February 2004. Because most of the site is in a flood area no buildings are proposed in the application, except the proposed Heritage Technology Centre, together with an hotel and surrounding car parks at



At the very north end of the site, much of which is already covered in tarmac or concrete. The southern half has already lost most of its conservation interest because a few years ago much of the alluvial sand was scraped from the site to make a Go-kart race track. The sand was piled in a long mound on the west side of the site which now provides excellent habitat for sand nesting bees and wasps.

David suggests that the sand mound and the herb-rich mesotrophic grassland adjoining it on the east should be retained untouched, unmown and without any tree-planting. He notes, however, that the owners intend to build a large car park along the west bank of the River Wey which would destroy some of the best habitat. The rest of the largely bare sand area, where most of the aculeates nest, would also disappear if permission is given for a grass airstrip to the east of the perimeter road. It is also proposed that all the remaining dry acid grassland should be levelled and then re-sown with a grass seed mixture which would then be fertilised twice a year and mown regularly. This would completely destroy the valuable and – for Surrey unique – habitat that exists at present. In David's assessment, the proposals both for the car park and the grass airstrip should, and could, easily be modified so that the existing drought-prone grassland is retained.

In view of the importance of this site, we intend to publish an update on the case after the planning authorities have considered the call for a review of the development proposals. Meanwhile, Buglife is taking up the matter and is hoping to persuade the authorities to think again, as in the case of the celebrated Canvey Island brownfield site (see *ICN* 40 and 41).

### **Hornet robber fly in South Wales**

As mentioned in *ICN* 26, the Hornet robber fly (*Asilus crabroniformis*), a rather spectacular predator of dung-feeding insects, was once widespread in lowland England and Wales. By the 1990s, this Biodiversity Action Plan Priority species was known from fewer than 20 sites, concentrated in the Dorset heathlands of southern England and in parts of South Wales. In that *ICN* report, we mentioned that two previously unknown populations in South Wales were found near Swansea and on the Gower Peninsula in 1997.

A more recent find in South Wales, which has received some coverage in the UK national news, is at Castle Meadows near Bergavenny, Monmouthshire. There were some press interviews with





Mr Colin Titcombe, who made the discovery, and with Ian Smith, the head warden at Monmouthshire Countryside Service, who said that the thriving population of the flies demonstrates the conservation benefits of the current grazing regime. As mentioned in our earlier *ICN* articles, the dung beetles which form the prey of the larvae of *A. crabroniformis* cannot develop in the dung of animals that have been treated with the anti-helminthic drug ivermectin.

It is good that there is a sympathetic management at the newly recorded Welsh site. Certain other sites where the fly has recently been found (e.g. Portsdown in Hampshire and Whitehawk Hill in the neighbouring southern English county of Sussex) have been the subject of actual or proposed construction work. The fly's survival on such sites will depend on rigorous measures to protect its habitat.

### **Mussel beds in Strangford Lough, Northern Ireland**

In June 2002, there was a government press release concerning a serious decline in the population of Horse mussels *Modiolus modiolus* in Strangford Lough. The Horse mussel is a bivalve mollusc, which forms biogenic reefs in Strangford Lough and is a major feature of interest in the Strangford Lough Marine Nature Reserve and candidate Special Area of Conservation. It is a deep water species similar to but larger than the blue mussel that is found on the shore.

The decline was so severe that no live mussels could be found at the time of the press release. A search of government websites has not revealed whether any live individuals have been found since then. The mortality event was known to have occurred at some time between 1999 and its discovery by government scientists in 2002, perhaps during 2002, according to very preliminary evidence. Although the news emerged over eighteen months ago, we have not previously covered this matter in *ICN* and we are therefore reproducing the press release and some of the accompanying notes. The government minister concerned was Mr. Dermot Nesbitt, who was quoted as follows:

"The Horse mussel beds are an important feature in the ecology of Strangford Lough and are one of the reasons why the Lough has been designated a Marine Nature Reserve and identified as a candidate Special Area of Conservation. The conservation of the horse mussel beds features prominently in the management scheme for Strangford Lough. Scientists from EHS and DARD (*government institutes – ICN ed.*) have been monitoring the marine life of the Lough as part of this scheme and reporting to the Strangford Lough Management Committee.



"During the course of this work, no live mussels have been found in those parts of the Lough examined. Other associated species may also be affected, including the queen scallop which is the basis of a small commercial fishery.

"The causes of this decline, which is believed to be recent, are currently unknown. I have though asked for an urgent report from my DARD officials who are working in tandem with DARD on this. Further, I have been assured that the condition of horse mussel beds in other areas around the British Isles will now be checked as part of this work"

According to the UK's Joint Nature Conservation Committee, *M. modiolus* is a widespread and common species on British coasts, but only forms its biogenic beds in a much more limited range of areas in parts of northern and western Britain, including Shetland, Orkney, the Hebrides and other parts of western Scotland, the Ards Peninsula and Strangford Lough in Northern Ireland, off both ends of the Isle of Man, off north-west Anglesey and north of the Llyn Peninsula in Wales. In a few places, the beds are so prominent as to be regarded as "biogenic reefs".

*M. modiolus* is a long-lived species and individuals within beds are frequently 25 years old or more. Only the juveniles (up to three to six years old) suffer a high predation rate, but human activities such as trawling and dredging can cause severe damage to the mussel beds. Recovery after such damage is very slow or may not occur at all. In the case of Strangford Lough, where there is a scallop fishing industry, the beds had been subjected to widespread damage prior to the recent mortality event. However, there was no evidence that fisheries activity had caused this severe event. Indeed protective regulations had been in force since 1993.

Other causes of mussel mortality include pollution and perhaps attack by pathogens or parasites, and these were being investigated at the time of the press release. Investigations were also in hand at other UK coastal sites, although the Strangford Lough population had been better studied than any other. Other work is being done off the Llyn Peninsula to develop appropriate survey and monitoring techniques as part of the demonstration project for the UK Marine Special Area of Conservation project. The Countryside Council for Wales is the lead organisation for this work.

### **Dogsthorpe Star Pit, Peterborough, eastern England**

ICN 34 carried an article about this Site of Special Scientific Interest, where geological conditions give rise to brackish aquatic habitats that



are usually found only in coastal areas. Over the years that the pit was worked for clay extraction, an interesting flora and invertebrate fauna developed, especially in association with the brackish pools. When extraction ceased in 1993, so did the regular pumping of water from the pit. This caused excessive flooding of the habitats, but the Wildlife Trust for Bedfordshire, Cambridgeshire, Northamptonshire and Peterborough acquired the site in 1997 and later secured commercial sponsorship through landfill tax credits to control the water level and to provide facilities for visitors.

The Summer 2003 issue of *Wildlife Action*, the Trust's magazine, reported that the restoration scheme was nearing completion. This involved the restoration of the old brick pit pump, which was then used to reduce the water level to leave a series of shallow pools. Also, some scrub clearance was undertaken so as to make room for grassland and bare ground communities on the south bank of the pit. The reserve was due to open to the public by the end of 2003.

### **The Salt Creek tiger beetle in Nebraska, USA**

The Fall 2003 issue of "Wings", published by the Xerces Society, includes an article by Joel Sartore and Steve Spomer about a threatened tiger beetle, *Cicindela nevadica lincolniana*, which depends on an inland saline wetland system. This rare subspecies is known only in a few remnant saline marshes near the city of Lincoln, Nebraska, an area that is being encroached upon by residential and commercial development.

Studies of the beetle's population over a ten-year period have shown large annual fluctuations between about 100 and 800, suggesting that it could easily become extinct due to further habitat loss. Sartore and Spomer point out that most of the habitat has already gone and that the beetle now seems confined to two small colonies on a small stretch of Little Salt Creek. Although the beetle is listed as endangered by the State of Nebraska and has been proposed for national listing, the Lincoln City planners approved a massive new development in 2000, with very damaging consequences for the entire ecosystem. The authors see no easy options for mitigating the impending destruction and degradation of the marshes and feel that the people of Lincoln need to face a stark choice.

### **White-clawed crayfish in Durham**

As reported in recent issues of *ICN* various wildlife trusts in Britain, together with the national agencies, have been surveying rivers for the





native crayfish *Austropotamobius pallipes*, which is severely threatened by a fungal pathogen that was introduced with the American Signal crayfish, *Pascifasticus leniusculus*. Sadly, the latest report, from the Durham Wildlife Trust in north-east England, is not encouraging. The Trust reports in its winter/spring 2004 magazine that, during a survey of the River Tees and its tributaries, the crayfish was found at only a handful of sites, generally concentrated in Baldersdale. Stuart Priestley, the Trust's wetland conservation officer reviews the prospects for saving the native crayfish in Britain and concludes that the continued spread of the alien species leaves no easy answers.



## RESEARCH NOTES

### Field testing of genetically-modified insects

Much of the recent debate about genetically modified organisms has focussed on food crops. There has, however, been considerable interest in the commercial use of genetically modified (GM) insects and other invertebrates, including both pests and economically useful species. Recently, Paul Elias, a science writer in the USA, has been expressing concern about the possible dangers of this technology. He refers to various examples of insect experiments that he fears may soon escape the laboratory. Similar fears were expressed by the Union of Concerned Scientists as long ago as 1997, who pointed out that many genetically engineered insect species had already been created in laboratories for a variety of purposes.

Paul Elias and others are concerned that the widespread release of GM invertebrates into the environment could present significant environmental risks because many reproduce rapidly, they play a variety of important ecological roles, they can move considerable distances, and most would be difficult to control once released. Elias argues that the impact that GM invertebrates could have on ecosystems is only now being explored, even as applications for field trials are being prepared. He draws a distinction between genetically modified crops or livestock and modified pest species. The former can be kept in controlled conditions (e.g. GM silkworms that could produce spider silk for use in bullet-proof vests). In contrast, pests are to be manipulated across their wild populations. For example, tsetse flies could be



rendered incapable of transmitting sleeping sickness, a deadly disease that afflicts millions of people (and their livestock in a related form) in Africa. Similarly, mosquitoes could be modified so as not to transmit malaria.

Elias writes that no biotech insect experiment has been conducted outside a laboratory yet, but that a few projects are getting close to this stage. In 1997 a research worker at the University of Florida applied for a permit to conduct a field test with a transgenic version of an economically useful mite (a biocontrol agent) that feeds on spider mites, a pest of strawberries and ornamental crops. At the time, the US Department of Agriculture (the licensing body) was criticised for not planning to have an official public comment period or hearing on the application. Instead, it intended only to publish a notice in the Federal Register when the decision was made. The mite had been engineered to contain a bacterial gene that functions as a marker, making it easy for researchers to track the organism in the environment. There were also plans for future experiments involving the introduction of new genes intended to modify the mite to enhance its ability to kill pests.

The projects that are now nearing the field-trial stage have prompted calls for the US federal government to begin adopting strict regulations. Only one such project is already the subject of an application for a field trial; this concerns the pink bollworm *Pectinophora gossypiella*, a moth larva which damages cotton plants by eating through the flower or tunnelling through the cotton boll to devour the seed. Elias writes about the work of Thomas Miller, professor of entomology at the University of California, Riverside, which is reportedly supported by a \$1 million grant from the California cotton industry. Prof. Miller is trying to create a genetically modified bollworm that carries a gene lethal to its own offspring. If it works as expected, the release of this GM bollworm will reduce the bollworm population and the damage caused by it. The planned trial would, however, involve a marker gene to be tracked within the bollworm population, rather than the lethal gene.

It would be wrong to condemn all research on the genetic modification of invertebrates, as there could be great environmental benefits in the form of reduced pesticide usage, in addition to the alleviation of human disease and poverty. However, great caution is clearly needed. To quote Michael Fernandez, Science Director of an American watchdog organisation called Pew, "Usually biotechnology seems to move more quickly than the regulations, but in this case, we have the time." Others have, however, pointed out that no U.S. law specifically addresses GM invertebrates. The U.S. Department of



Agriculture's written policy on engineered insects asserts regulatory authority only over "plant pests," requiring that any outdoor experiment must get prior federal approval. A lack of federal control has already allowed the marketing of a GM vertebrate; the "Glofish", a fluorescent zebra fish.



## FUTURE UK MEETINGS

### **Invertebrate Link national conference: Peterborough**

The date and time for this have been set: 10.30 a.m. on Saturday 3rd April 2004 at the Peterborough library. Representatives of the various invertebrate societies and groups and other conservation organisations will be invited and some additional places may be available. In order to contact the organisers, please first contact David Lonsdale at [d-lonsdale@supanet.com](mailto:d-lonsdale@supanet.com) or +44 (0)1420 83742.

### **UK National Moth Night: 22nd May 2004**

This year's national event is to include day-flying moths amongst the target species, in addition to the recording of moths generally in observers' back gardens and at special local events. Information is available from: [www.nationalmothnight.info](http://www.nationalmothnight.info) or from Dept. NMN, Butterfly Conservation, Manor Yard, East Lulworth, Wareham, Dorset DT20 5QP (enclosing an A4 34 pence-stamped addressed envelope).

### **Coucestershire Wildlife Trust: 14th May 2004**

Simon Glover is to talk about "Dean's Disappearing Butterflies", highlighting the plight of species lost from the Forest of Dean since the 140s and discussing ways of bringing them back. The talk is due to start at 7.30 p.m. at the Baptist Rooms, Coleford; admission £1; non-members welcome.



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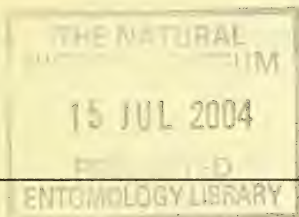
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# Invertebrate Conservation News



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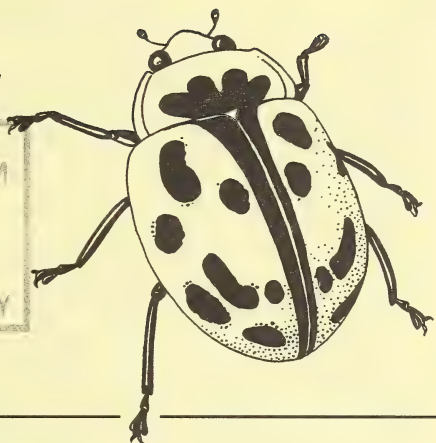
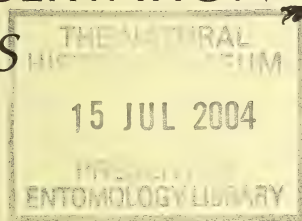
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# INVERTEBRATE CONSERVATION NEWS



No. 44, June 2004

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## EDITORIAL

While this issue of *ICN* was going to press, members of the British monitoring public were being encouraged to take part in the "Big Bug Count", a survey organised by the Royal Society for the Protection of Birds. As explained in one of our items below, the survey involves counting the remains of insects splattered on car number plates during journeys made within different parts of the country. The survey is based on the concern that insects seem to be in short supply as a food source for many bird species, especially in areas where agriculture is intensive. The use of large numbers of cars as mobile sampling traps ought to show up any major differences in insect abundance across Britain, despite concerns about scientific quality control.

From the perspective of invertebrate conservation, the survey has some interesting connotations. One of these is the portrayal of insects as mere bird fodder. In order to avoid this, the RSPB's survey website includes some information (provided by Mark Telfer) about the ecological and economic importance of invertebrates. This information does not, however, seem to have got through to some of the journalists covering the survey. Some of them presumably feel a glow of enlightenment, having discovered that insects have a use as bird fodder. Thus, despite the RSPB's best intentions, it requires some optimism to hope that the survey will be better than neutral in its effects on the public perception of insects and other invertebrates (other than butterflies and perhaps dragonflies).

By making use of cars as mobile killing traps, the survey brings to mind the worrying fact that invertebrates (not only airborne insects) are killed in vast numbers on roads. Roads are also a barrier to dispersal and thus a threat to the long-term survival of populations of many



species. The significance of 'road kill' as a factor in the decline of invertebrate abundance or diversity is not known, but it is presumably growing with the increased building, widening and usage of roads. Of course, the survey itself is not contributing to road kill, unless perhaps it encourages some motorists to take 'the car' out for a jaunt just so as to gather some data. On the other hand, there seems to have been a missed opportunity to raise awareness that invertebrate 'road kill' is a problem worthy of research in its own right, rather than being merely a survey tool.

There is a certain irony using the indiscriminate mass-killing of invertebrates as a survey tool while entomologists who need to collect individual specimens are faced with an increasing burden of legal controls. It would clearly be absurd to throw motorists in jail for accidentally killing legally protected species, but it is equally absurd to impose anti-collecting laws or regulations except where they have demonstrable value for conservation. Fortunately, the listing of UK species for such protection has not strayed very far from this criterion. It is therefore unlikely that any of those listed species will be counted in the RSPB survey. In any case, their splattered remains will probably not be accurately identifiable and so the survey volunteers should have no fear of prosecution. It is, however, interesting to ask whether a volunteer could legally be regarded as collecting insects intentionally (as opposed merely to killing them as an incidental result of lawfully driving a motor vehicle for other purposes). If so, the method of collecting could in legal terms be deemed 'reckless' unless the accused knew with certainty that a protected species was not trying to cross the road.



## NEWS, VIEWS AND GENERAL INFORMATION

### **The Nature Conservation (Scotland) Act**

The revision of wildlife legislation is a dull and tedious affair but the resulting law can have important implications for conservation. At its best it may help to prevent the destruction and degradation of important habitats, while at its worst it may discourage field studies and unnecessarily antagonise landowners. The new Nature Conservation (Scotland) Act can be understood only by scrutinising earlier law, in particular the Wildlife and Countryside Act 1981, which it amends. Not only for this reason, but also because the new wording is exceedingly



complex in places, the new law would take assiduous reading to see whether invertebrate conservation will be significantly affected, either for better or for worse. Its main thrust is to tighten up loopholes in the 1981 Act and to make special provisions for Scotland.

As far as protected species are concerned, the new Scottish law adds the word "recklessly" to "intentionally" when defining criminal offences that involve taking and injuring specimens. This could have unfortunate ramifications for any field studies which might involve the unintentional (but arguably reckless) capture of protected species. It may, however, prove worthwhile in another context, i.e. the damaging of protected habitats. The problem with "reckless" was highlighted by a task group that reviewed the 1981 Act on behalf of Invertebrate Link. The resulting report was prepared only for the English and Welsh government departments concerned, and it is perhaps unfortunate that the Scottish review did not involve a similar contribution from invertebrate interests. In any case, "reckless" appears to have become a standard term that will be used remorselessly in the desire to close perceived loopholes.

### **Ragwort: more news about legislation in England**

As previously reported in *ICN*, a new law was passed in 2003 for the control of common ragwort *Senecio jacobaea* in England. This happened despite representations from wildlife organisations, including the AES, who questioned the need for the legislation and expressed concern about its potential effects on the many organisms that depend on ragwort (see *ICN* 43). These species include 30 invertebrates that are totally dependent on ragwort.

Although enactment of the new law was not prevented, there was subsequently a further opportunity to propose amendments of the draft code of practice, under which the law is to be applied. Despite some structural improvements, the latest draft failed to reflect many of the amendments that were previously suggested in the interests of invertebrate conservation. There was little attempt even to remove some of the inappropriate language (e.g. the word "infest" to describe colonisation of land by ragwort) that marred the earlier draft. Also, there was no response to one of our most important suggestions; i.e. that the code should be enforceable only within a narrow zone around pictures or forage crops; i.e. less than the 50 to 100 m that is arbitrarily stated in the draft without reference to available data on the dispersal range of ragwort seeds.





The AES, along with other organisations, (e.g. Buglife – The Invertebrate Conservation Trust) and with the umbrella group Wildlife & Countryside Link, took the opportunity to comment again on the draft code and we are currently awaiting the outcome. Also, the Royal Entomological Society chose ragwort as a topic for National Insect Week (NIW, 14 -20 June 2004: see below). At the time of writing, anyone with Internet access is able to view the draft code of conduct at: <http://www.defra.gov.uk/corporate/consult/ragwort/index.htm> and members of the AES Internet Forum are able to view the AES submission at: <http://groups.yahoo.com/group/aes/files/RagwortCode.doc>

### **Wildlife Trusts' Invertebrate Network UK**

The Wildlife Trusts' Invertebrate Network (WIN) is the e-mail-based successor to the Invertebrate Specialist Group (ISG) of the Wildlife Trusts, the umbrella group to which the UK's 47 individual Wildlife Trusts belong. Martin Harvey, who ran the ISG, reported that it ceased to function because most of its members had moved jobs. The network includes invertebrate specialists and biodiversity/conservation officers at the various Trusts. Its role is to provide an efficient way of disseminating invertebrate information around the Trusts and of seeking views on particular issues as required. Martin, who is the contact person for WIN, is the Biodiversity Data Manager at Hampshire & Isle of Wight Wildlife Trust, e-mail: [MartinH@hwt.org.uk](mailto:MartinH@hwt.org.uk) tel. 023 8068 8902.



## **SITES AND SPECIES OF INTEREST**

### **Update on Salt Creek, Nebraska**

ICN 43 included some information about this site in the USA, referring to an article in *Wings* magazine, published by the Xerces Society. The site is an unusual saline wetland that supports a rare tiger beetle *Cicindela nevadica lincolniiana*, which is on a state list for endangered species and is a candidate for the federal list.

Joel Sartore, a board member of the Conservation Alliance of the Great Plains and an author of the *Wings* article, has campaigned for the protection of the site. He and other wildlife advocates requested the Nebraska Game and Parks Commission to buy the 156-acre (63 ha) tract of land, which lies just north of Lincoln.



In March 2004, the Commission deferred a decision because of concern about the high price of the land, which an independent appraisal had set at US \$449,400. At another meeting, on 21st May, the Commission agreed to help the City of Lincoln purchase the land. This will be achieved with the help of a State Wildlife Grant from a federal programme intended to benefit wildlife other than game species, together with a Nebraska Environmental Trust grant. The land will be owned by the City and managed by the Commission.

### **More river pollution incidents in England: native crayfish killed**

Serious river pollution events are sadly occurring with almost predictable frequency in the UK. One such incident was detected in April 2004 during routine chemical sampling on the River Lyvennet, a tributary of the river Eden, near Morland in Cumbria, north-west England. Reportedly, hundreds of the endangered white-clawed crayfish *Austropotamobius pallipes*, the UK's only native species, were killed by pollution affecting stretch of water several kilometres long. The pollution also wiped out other invertebrates, such as freshwater slims. Environment Agency officials, while still awaiting chemical analysis, commented that the Eden catchment had already suffered badly from pollution incidents. Synthetic pyrethroids were to blame for the mass killing of invertebrates on large stretches of the rivers Caldew and Irthing in the late 1990s.

In June, yet another incident occurred in Cumbria, this time on the River Mint at Patton Bridge, north east of Kendal. A member of the public reported seeing crayfish dead or in distress and this was confirmed by EA officers, who thought that thousands of individuals could have been affected. A 10 km (six-mile) stretch of the river is believed to have been affected by the incident and, at the time of the report, EA officers were still checking whether the pollutant had affected the neighbouring River Kent.

### **Old water coral reefs: campaign to halt damage**

Old water coral reefs occur on the edges of continental shelves, in fjords and around offshore submarine banks, vents and seamounts. The waters in which they have been found range from 4°C to 13°C in temperature and in depth from 40 m (130 ft) to 6,300 m (20,475 ft), although more usually between 200 m (650 ft) and 1,000 m (3,250 ft). Carbon-dating shows the coral colonies to be as much 8,000 years old. The reefs are a relatively new discovery, but it is only very recently that



oceanographic survey techniques, employing advanced underwater cameras and deep-sea vehicles, have begun to shed new light on the true importance of the reefs and, sadly, the severity of damage that is being inflicted on them by deep water fisheries.

Individual reefs can be very large, as in the case of one found recently in the Norwegian Sea with an area of 110 km<sup>2</sup> (40 square miles). The combined area of the North Atlantic reefs, stretching from Norway to West Africa, exceeds that of some of the famous warm water reefs such as the Great Barrier Reef off the coast of Australia. Following the first discoveries of cold water coral reefs in the North Atlantic, they have also been found in the South Atlantic, Pacific and Indian Oceans and the Mediterranean Sea. They lie within the marine limits of more than 40 countries, including the UK and Ireland.

Cold-water corals (Phylum Cnidaria, Class Anthozoa) build beautiful and fragile 3-dimensional lace-work structures. They are closely related to the species forming reefs in warm, tropical waters but, due to the greater depth of their reefs, they grow in the dark and thus have no association with symbiotic algae as a source of nutrition. They are therefore nutritionally dependent on ingesting plankton and other organic matter. Research so far suggests that there may be as few as six main types of cold water coral, compared with several hundred warm water species. One of the main genera, which occurs in the Atlantic and in parts of the Mediterranean, is *Lophelia* (white corals), which are also found on the sub-Antarctic Macquarie Ridge off New Zealand. Other genera include *Madrepora*, *Oculina*, *Enallopsammia*, *Goniocorella*, *Solenosmilia* and *Octocorallia*. The last named is a soft coral and its feathery tentacles can form 'gardens or forests'.

The reefs are home to a unique fauna which includes marine invertebrates such as sponges, starfish, sea urchins, brittle stars, snails, clams, squids, crabs and sea spiders. Until recently, some of these were known only as fossils at least 2 million years old. The reefs also support various deep water fish and it is their exploitation by fisheries that causes most of the damage.

Seamounts now known to support cold water coral reefs are being exploited by fishing vessels that can no longer make a living in over-exploited traditional fishing grounds. They use trawls with giant rollers and chains weighing as much as ten tonnes to catch deep-water fish, such as the Orange roughy *Heplostethus atlanticus*, Blue ling *Molva dipterygia*, Roundnose grenadier *Coryphaenoides rupestris*, Black scabbardfish *Aphanopus carbo* and some deep water sharks. As cold





Water corals are extremely fragile, trawling can damage them very seriously. The damage is not easily repaired, as the estimated growth rate of the corals is one tenth of that of their warm-water counterparts. Surveys show that some reefs, especially in the East Atlantic, have been destroyed or are so badly damaged they might never recover. Most others show scars from trawling.

The targeted fish species are long-lived and they grow and reproduce more slowly than shallower living species such as herring *Clupea harengus* and cod *Gadus morrhua*. For example, the Orange roughy can live for 150 years. The fish stocks at an individual seamount can therefore be rapidly exhausted, at which stage the trawlers are alleged to move to another seamount and repeat the destruction. Klaus Töpfer, the United Nations environment director, has therefore described these fisheries as unsustainable. Other threats include impacts due to oil and gas exploration and production, the laying of cables and telecommunications links and waste disposal.

Environment groups have been pressing for an immediate international moratorium on deep sea trawling pending further research on the newly discovered life forms of cold water coral reefs, and the vulnerability of fish and other species to deep sea trawling. The groups are seeking a UN resolution to this effect. UN policy makers were due to meet in June to find new ways of regulating deep sea fishing. Meanwhile, on 4th June, Klaus Töpfer of the UN launched a campaign to save the reefs and ban destructive trawling. He said that the main focus on coral had hitherto been on the warm water variety, the importance of which has long been known, both for biodiversity and for tropical fisheries. Mr. Töpfer also announced a new United Nations initiative to help conserve warm water corals.

Some of the new information has emerged from previews of a research report on the problem of damage to the reefs. The report, entitled "Cold-Water Coral Reefs: Out of Sight- No Longer Out of Mind", is due to be released on 28th June at the 10th International Coral Reef Symposium before being published in full at an International Coral Reef Initiative meeting at Okinawa, Japan (3rd – 4th July). The release of the report is intended also to mark World Environment Day, which is being hosted by the City of Barcelona, the Catalan Regional Government and the Government of Spain. This event is intended to highlight cold water corals as a new Global Conservation Challenge. The author of the report is Professor André Freiwald, of the University of Erlangen-Nuremberg, who has been working with the World Conservation Monitoring Centre in Cambridge, UK. His survey was



financed by international NGOs and a number of European governments, including the UK.

Some countries, including Ireland, Norway, the UK and the USA, have over recent years designated some of their cold-water coral reefs for protection, for example as Special Areas of Conservation (SACs) or Habitat Areas of Particular Concern. Another possible form of designation would be as Marine Protected Areas. In 2003 the UK government announced that it intended to apply SAC designation to an area known as the Darwin Mounds, which is about 150 km off the coast of north-west Scotland.

The Darwin Mounds consist of hundreds of *Lophelia pertusa* reefs about 185 km off the north-west coast of Scotland at a depth of about 1000 m. They are individually up to 5 m high and 100 m wide and collectively cover approximately 100 km<sup>2</sup>. They have been identified by the UK's Joint Nature Conservation Committee as the best example of a cold water coral reef known in UK waters. Their SAC designation will help to fulfil the UK's duty under the European Habitats Directive to take protective action, but this can only be effective if there are legal restrictions on all countries that come under the European Union's (EU) common fisheries policy. Such measures (i.e. to ban all deep water trawling in the area of the Darwin Mounds) were recently agreed by EU fisheries ministers, following a request from the UK government to invoke a recently revised regulatory framework. The measures will be in operation for six months and can be extended for a further six months. In the meantime, the European Commission will develop permanent measures to protect the area.

On a related matter, Mr. John Randall MP is trying to amend UK law relating to marine nature conservation and its enforcement. Having tried unsuccessfully to do so in 2001, he is now seeking in particular to establish a marine equivalent of Sites of Special Scientific Interest, as proposed by Wildlife and Countryside Link. This time, his 'early day motion' has received considerable cross-party support, but the success of his Bill will depend on the availability of parliamentary time. He also wants to see a framework for resolving potential conflicts between activities such as fishing, other commercial exploitation and nature conservation.

### **Dibden Bay port proposal (S. England) rejected**

As mentioned in *ICN* 40, there was a protracted public inquiry into a proposal for a new container terminal at Dibden Bay on Southampton Water, southern England. The developers (Associated British Ports)



have argued that, with the increasing size of cargo ships, Britain needs new deep-water terminals and will otherwise be at an economic disadvantage. They proposed to build six berths along a 1.85 kilometre-long quay, covering some 240 hectares of the site, known as the Dibden Reclaim, and taking some 76 hectares of inter-tidal foreshore. The troubles was that some of this area is designated as of international conservation importance and that its loss to development would destroy coastal wildlife habitats which support some rare invertebrates. These include the carabid beetles *Anisodactylus poeciloides* and *Amara strenua*, which are among five Priority Species under the UK Biodiversity Action Plan. The lead partner for *A. poeciloides* is the Action for Invertebrates project.

Recently, conservation bodies breathed a sigh of relief when Transport Minister Tony McNulty accepted the recommendation of the Dibden Bay Inquiry Inspector, Professor Keith Dyer, to reject proposals for the new terminal. The recommendation was based on environmental criteria, taking account of 6,141 representations that were received against the proposals. Objectors included Hampshire County Council, New Forest District Council, English Nature, the Environment Agency, the RSPB and local residents. There were 190 or more representations made, including 172 expressions of support for the proposed development. Southampton City Council was the only public body which supported the proposals at the inquiry.

The Inspector noted that ABP no longer adhered to initial conclusions, based on an environmental assessment, that the impact on sites of European importance would be acceptable. He considered the assessment to be fundamentally flawed in that it treated compensatory measures as mitigation and wrongly relied on proposed habitat creation outside the European sites in concluding that the development would not adversely affect their integrity. He therefore placed no reliance on the assessment. He expressed concern specifically about the Solent and Southampton Water Ramsar site and Special Protection Area (SPA) and the Solent Maritime cSAC (candidate Special Area of Conservation) and the River Itchen cSAC. The effects of the proposed development on the River Itchen cSAC had not been included in the assessment. Thus, he recommended rejection of the proposals, even though he accepted that the deep water berths would have provided economic benefits.

### **Logger wasp in East Anglia: conflict of interests**

A proposal to build a new school in Suffolk, eastern England, has come up into conflict with English Nature's intention to designate a site of special scientific interest at Red Lodge Heath, near Newmarket.





A number of rare insects, including the five banded tailed digger wasp *Cerceris quinquefasciata*, have been found there. Local people have expressed the view that a school is more important than an insect of which they were previously unaware, but it seems that an alternative building site is available. A decision on the proposed SSSI designation, which could cover an area of 50 acres (22.3 ha) is expected in July.

### **Brooklands, Surrey: further news**

In *ICN* 43, we reported the efforts of David Baldock to save this site in south-east England from unsuitable development. The plan, submitted by Daimler Chrysler, was to develop the site into a Heritage Technology Centre and Community Park. Without modification, the planned development would have damaged some important invertebrate habitats associated with acid grassland and areas of bare sand. As mentioned in *ICN* 43, the aculeate Hymenoptera are of particular interest. The fear was that the plans would go ahead, as outline permission had already been granted.

David has since reported that Daimler Chrysler received detailed planning consent in March but on condition that a full entomological survey is done before any work starts and that there must then be an agreement with the Borough Council so as to minimise damage to the best area. (The survey is being done by Dr. Jonty Denton.) The developers also have to comply with all the recommendations put forward by English Nature (EN) and the Environment Agency (EA); i.e. not to destroy the acid grassland but to leave it as it is, and to create sand mounds for aculeate nest sites from any sand that has to be removed for flood prevention purposes etc. All these recommendations were ones which David had suggested to EN and EA and to the Council, acting on behalf of Buglife – The Invertebrate Conservation Trust.

### **Thames Gateway: brownfield myths perpetuated?**

Invertebrate specialists have been working so as to seek ways of mitigating the adverse effects of the massive major redevelopment that is planned for the Thames Gateway, the land that lines the estuary east of London. There are threats both to greenfield and brownfield habitats, but the importance of the latter for wildlife is still not widely appreciated, despite much well-argued campaigning. Awareness is growing, but there is still unfortunately too much scope to simplify the issues by perpetuating myths about greenfield versus brownfield land.



Those in government who find it convenient to perpetuate myths might have been heartened by a report issued by the Campaign to Protect Rural England, a respected 'green' organisation with excellent credentials (HM the Queen is its patron). The report, entitled "Thames Gateway: making progress", calls (among other things) for an immediate moratorium on greenfield development in the area. The report contends that "most of the Government's currently planned new housing could be accommodated on brownfield sites in London alone (excluding sites important for wildlife) and that there remains a large supply of brownfield sites elsewhere in the area". It suggests that, in the Gateway alone, 300,000 new homes could be built without encroaching on the countryside.

It is good that the CPRE now seems to accept that some brownfield sites are important for wildlife, but not so good that this acceptance seems not to have changed the main thrust of its arguments. Those of us who are concerned about wildlife habitats on all kinds of land should unite with CPRE in its wish to protect them, but this will be hard if CPRE press statements appear to promote a simplistic view of greenfield versus brownfield sites.

As Peter Shirley recently wrote in the Worcestershire Wildlife Trust magazine, "...the myth is that the wildlife value of intensively farmed land is greater than that of the average urban open space." He goes on to explain how valuable many brownfield sites are and he adds... "Compare these supposedly awful brownfield sites with their greenfield counterparts. These are often drenched in chemicals, managed far more intensively and are virtually barren of wildlife. They are often not at all accessible to local people. Why would building on them not be preferable to destroying wildlife-rich areas elsewhere?"



## RESEARCH NOTES

### The 'Big Bug Count': an RSPB survey

During June 2004, the Royal Society for the Protection of Birds was asking people in Britain to count splattered insects on their vehicle number plates. The RSPB explains that many species of bird... "depend on insects – either as the main part of their diet or as food for their chicks. Swallows and house martins are specialised insect hunters but seed eating birds, such as skylarks and house sparrows, also need



insects to feed to their young". It goes on to say that, despite the importance of insects to birds, there has been little monitoring work. It has therefore identified the need for a scientific study to back up the anecdotal evidence suggesting that insects have declined.

Participants in the survey could apply for instructions so as to ensure that everyone used the same sampling methods. Also a free sampling grid (a 'splatometer') was available.



## BOOK REVIEW

### **Shieldbugs of Surrey**

by Roger D. Hawkins, published by Surrey Wildlife Trust 2003, 192 pp., 24 colour plates, distribution map for each species. Hard cover £15.00 (plus £2.40 postage & packing). ISBN 0-9526065-7-7. Available direct from Surrey Wildlife Trust, School Lane, Pirbright, Woking, Surrey, GU24 0JN, Tel: 01483 488055, E-mail: surreywt@cix.co.uk.

The *Shieldbugs of Surrey* by Roger Hawkins is a superbly informative, well-illustrated and highly readable monograph describing the shieldbugs and allied Heteroptera of Surrey. This book has been favourably reviewed elsewhere (Hodge, 2003; Marren, 2003) but it is worth reviewing its importance with respect to the conservation requirements of this group of insects. The value of this work to the conservationist is effectively summarised by Marren: "Almost every aspect of the study and conservation of shieldbugs is covered".

Conservation is a theme of the Preface by Sir Richard Southwood. He emphasises the book's contribution towards knowledge that he regards as prerequisite for the conservation of this (and any other) group of insects. In praise of the author's analysis of past and present records, he states that an understanding of the effects of human activities on biodiversity "depends on following the fortunes of particular species". He adds that "for this to be achieved, the organisms must be readily identified by general naturalists". Therein lies the beauty of this book, as its keys are well illustrated, easy to use and, pleasingly, are not restricted to the Surrey fauna (which accounts for approximately three-quarters of British species). Identification is aided by outstanding colour plates which depict each species and thus help to make this book an essential addition to the knapsack of any field entomologist.





For those with an interest in the identification, biology and conservation of this fascinating group of insects, this 'benchmark' publication will indeed, as Southwood puts it, "bring shieldbugs into the fold".

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- Hodge, P., (2003). Book Review: Shieldbugs of Surrey. *Bull. Amat. Ent. Soc.* **62**, (No 451), 262.
- Marren, P., (2003). Book Reviews: Shieldbugs of Surrey. *British Wildlife* **15**, (No. 2), 148.

Peter Sutton



## FUTURE MEETINGS

### National Insect Week events

In the UK, National Insect Week was in progress as this issue of *ICN* went to press. Organised by the Royal Entomological Society of London, with assistance from the AES and other organisations, the Week included a series of very interesting events, not only at London's Natural History Museum but also at various regional venues. We may provide some reports in a future issue of *ICN*. Meanwhile, readers are encouraged to visit the NIW website ([www.nationalinsectweek.co.uk/index.htm](http://www.nationalinsectweek.co.uk/index.htm)) which carries details of longer-term projects, such as public-participation surveys of the glow-worm *Lampyrus noctiluca*, bumblebee nests and a ragwort-associated insect, the Cinnabar moth *Tyria jacobaeae* (see below, in the item on ragwort legislation). Although the moth is not rare, it was chosen as a species that, being easily recognisable, can be a flagship for the other invertebrates that depend entirely on ragwort.

### Future field meetings

We usually list a small selection of field meetings, but we are aware that the selection is very incomplete and arbitrary. Also, we would like to know whether readers find the lists useful. As an experiment, we have omitted a list this time, and we will welcome comments (to be sent, please to: David Lonsdale 01420 83743 or [d-lonsdale@supanet.com](mailto:d-lonsdale@supanet.com))

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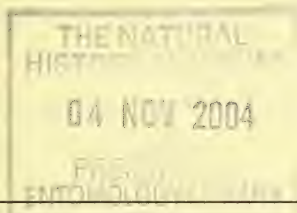
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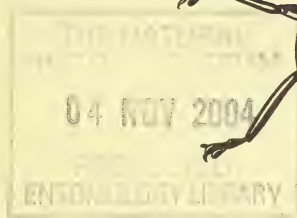
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# INVERTEBRATE CONSERVATION NEWS



No. 45, October 2004

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## EDITORIAL

The items below on the first UK records of the Harlequin ladybird *Harmonia axyridis* and the threat to a rare dragonfly from introduced predatory fish highlight a concern that flora and fauna can be seriously harmed by artificially introduced species. Some of the worst cases of harm occur in oceanic islands, such as Christmas Island, where the introduced Crazy ant *Anoplolepis gracilipes* has disrupted entire ecosystems. In Tahiti, the native *Partula* snails are on the verge of extinction due to predation by a carnivorous snail *Euglandina rosea*, which was released in an ill-considered attempt to control pest populations of the alien Giant African snail, *Achatina fulica*.

The native species of oceanic islands are particularly vulnerable, partly because they are not well equipped to face many of the potential competitors, predators and parasites which occur on larger, less isolated, landmasses. The problem is, however, not confined to island faunas. Many examples of ecological disruption can be found in North America, due to introductions of species such as the Gypsy moth *Lymantria dispar* and the beech scale insect *Cryptococcus fagisuga*. In the UK, a pathogenic fungus carried by alien species of crayfish has endangered the survival of the native White-clawed crayfish *Austropotamobius pallipes*.

Laws that control the release of alien species into the wild already exist in many countries. In the UK, it is illegal to release any animal into the wild if it is of a kind not normally present there, or if it is listed under other provisions that control the spread of species already occurring in restricted populations. Enforcement is difficult in the case of species which can legally be possessed in captivity, but easier if the species concerned cannot be legally possessed. The latter is a



draconian measure, which applies only to a few very harmful invertebrates under UK law, but there are certain others whose importation is banned under plant health regulations. In any case, alien species find other means of entry, e.g. by flying across international boundaries or by being imported with wood or other products.

In any attempt to strengthen legal controls over the introduction of potentially harmful species, it will be essential to identify whether the problems lie with the laws themselves or with inadequate enforcement. As exemplified in one of the articles below, it is all too easy to draft unreasonable laws as a rarely enforced 'catch-all', so that the law falls into disrespet.



## NEWS, VIEWS AND GENERAL INFORMATION

### Publication of ragwort control code of practice in England

In *ICN 44*, we reported that the AES, together with other organisations, had participated in a public consultation over the final draft of a code of practice for control of Common ragwort *Senecio jacobaea* under the Ragwort Control Act 2003. There had been concern about horses and other livestock being affected by ragwort poisoning, which causes suffering and eventual death. On the other hand, over-zealous control of ragwort could seriously harm populations of the many invertebrates and other organisms that depend on this native plant (see *ICN 43*). We were therefore concerned that the Code should strike the right balance between animal welfare on the one hand and conservation on the other.

The Code was published (in July 2004) under the title "*Code of Practice on how to Prevent the Spread of Ragwort*". It is pleasing to see that some of the inappropriate language of earlier drafts (e.g. the word 'infest' to describe colonisation of land by ragwort) was altered as the AES and others had proposed. However, the very title of the Code seems rather confusing in its use of the word 'spread'. There is a valid case for preventing the spread of ragwort to areas where it would demonstrably put livestock at an unacceptable risk of harm. The spread of ragwort elsewhere is, however, no less desirable than that of other native plants.





The Code states that risk assessments should be undertaken so as to decide where ragwort is to be controlled so as to prevent its spread on to land used for grazing and/or feed/forage production. The Code places such land into three risk categories: high, medium and low, depending on its distance from ragwort. If the land is within 50 m of flowering or seeding ragwort, it is deemed to be potentially at high risk. For medium-risk, the stated distance is 50 to 100 m from ragwort, whether flowering or not. The Code states that these distances are only guidelines and that there is a need to consider other factors; i.e. prevailing winds, topography, shelterbelts, natural barriers, soil type and vegetation cover of receiving land. The danger is that many people will take the easy way out and use the simple distance formula in place of a proper risk assessment. As a result, ragwort could be controlled unnecessarily in many areas.

The distance formula was one of several important things that conservation bodies asked to be amended and yet remained unchanged. According to calculations made by Matt Shardlow of Buglife – The Invertebrate Conservation Trust, 25 of 52 suggested amendments were accepted by Defra, but most of those only involved editorial improvements. Some of the more significant amendments that were rejected would have provided clearer exemptions for 'sites with nature conservation interest'. As reported below, there is already evidence that certain county councils are portraying ragwort as a wholly undesirable weed on nature reserves that they manage.

Even before the Act was passed, some organisations were already controlling ragwort in response to concerns about animal welfare. For example, in a press statement, the British Horse Society (BHS) had praised Oxfordshire County Council (OCC) for its control programme. Richard Dudding, OCC's Director for Environment and Economy, replied to a written question from Matt Shardlow, asking about the Council's criteria for targeting ragwort. Mr Dudding acknowledged that the Council had been co-operating with BHS in a ragwort control campaign on the county's road verges. However, he stressed that, in accordance with the new Code, the Council would in future focus on verges where ragwort poses "an obvious threat to horses and livestock". He also stated that herbicides would be used only where ragwort pulling was impracticable and then only selectively so as not to harm other plants of interest.

By contrasting OCC's past and present policies, Richard Dudding was perhaps conceding that, as suggested in the BHS press statement, there



was a previous aim to remove ragwort from all roadside verges in the county (i.e. far beyond the requirements of the Code). In a letter to BHS, Martin Harper, on behalf of Wildlife & Countryside Link, expressed concern about the message of eradication in the press statement. He also asked about a campaign by BHS to raise money to 'Rid Oxfordshire of Ragwort', alongside a similar campaign in neighbouring Warwickshire. Graham Cory, BHS Chief Executive, replied that the Society's aim was to educate landowners (including local authorities) about their legal obligations, but not to make them exceed the requirements of the Code. He did not explicitly accept any criticism about the BHS press release, but he wrote "...I will ensure that future publicity material or information we produce fully advertises the Code of Practice in a way which limits the scope for misinterpretation, making proper reference to the importance of ragwort to biodiversity."

It is instructive to look at the websites of some English local and central government organisations to see what they are currently (October 2004) saying about their ragwort control policies. Examples (including some items which were posted before the 2004 Code) include the following:

*Highways Agency*: "The Highways Agency leads the annual battle to eradicate ragwort..... Weed busting teams are currently scouring the verges of Merseyside's motorways and trunk roads including the M62, M57 and M58, and the A6036 near Bootle."

*West Sussex County Council* is planning to step up its war on the deadly weed Ragwort.... The County Council has always used a wide range of measures to try and keep the weed at bay from its roadside verges and nature reserves..... People who do believe they have seen Ragwort on road verges can report it to the County Council's three roads depots".

*Dorset (23/07/03)*: "Here in Dorset, the campaign to eradicate the deadly weed from roadside verges is well under way. Hundreds of kilometres of the county's roads are being cleared of the distinctive bright yellow plant".

*Buckinghamshire*: ... "The most affected sites [managed by the Council's Countryside & Heritage Group] are where work has been carried out to restore nationally important grasslands in the Council's care, resulting initially in ideal conditions for ragwort to grow. Control is included in subsequent management, within existing budgets (external grants are often secured to provide funds for this conservation work)".



Meanwhile, the well-known conservationist and writer Richard Mabey, vice-president of the Open Spaces Society, reportedly expressed horror at the results of ragwort control at a site in the East Anglian town of Diss, Norfolk. According to *The Eastern Daily Press*, he had previously known the site, called Fair Green, as a "tapestry of wildflowers, including Musk mallow, Yarrow, Lady's bedstraw, and other classic species of south Norfolk's sandy commons". Following ragwort control activities this year, he was quoted as saying that "the whole area had been sprayed or spot-weeded with systemic broadleaf herbicide. All the flowers were killed and contorted, the grass parched. Hardly an amenity for anyone or anything". Mayor of Diss, David Cooper, was quoted as saying: "We employed an expert to treat ragwort on the green. There was quite a bit and we had been advised it is harmful to horses that graze there". It appears that, as horses were present, the ragwort control was in compliance with the Code. However, this case confirms fears about the indiscriminate use of herbicides.

The Code is available free from: Defra Publications, Admail 6000, LONDON SW1 2XX (Tel. 08459 556000).

### **Concern over implementation of site protection law in England**

The need for wildlife protection law to be appropriate, practicable and fair has been a recurring theme of *ICN* articles and editorials. People who need to collect invertebrates so as to study them sometimes feel concerned about unnecessary legal restrictions, but they generally have less cause for such concern in the UK than in various other countries. The main reason for this relatively happy state of affairs is that the British list of fully protected invertebrates has largely (if not entirely) been reserved for species whose populations can reasonably be regarded as being at risk of harm from the collection of specimens. Also, there is a useful provision for protecting somewhat less endangered species from specific activities (e.g. unregulated trading) without criminalising their collection for *bona fide* purposes.

Although collecting is far less restricted in Britain than in certain other countries, the law nevertheless carries some potentially draconian powers. Not many people in Britain realise, for example, that criminal prosecution could be the fate of a person who possesses any specimen of an invertebrate fully protected under Schedule 5 of the Wildlife & Countryside Act 1981, but taken legally from the wild in another country (e.g. during a holiday). Any such specimens, no matter how





common in the country of origin, are deemed by the authorities to have been illegally taken in the UK unless the accused person can prove otherwise.

The protection of sites finds favour with invertebrate conservationists, as it addresses the very real problem of damage to habitats. Adequate site protection does not need to include any anti-collecting measures except perhaps in the case of vulnerable species, whose presence may have been a basis for designating an area as a Site of Special Scientific Interest (SSSI). Nevertheless, there has long been a 'blanket' ban on the unlicensed collection of specimens from most SSSIs. This was apparently imposed for reasons of administrative convenience, with the intention not to invoke such a harsh measure except in serious cases. Until the year 2000, no-one other than the occupier of land containing an SSSI could be prosecuted for a breach of the ban, but this could now happen to anyone who takes specimens from an SSSI. As most SSSIs are not marked on the ground, this situation is a potential worry to almost any collector anywhere, even if prosecution remains a long-stop which is not intended to make criminals of law-abiding people.

A recent case seems unfortunately to suggest that people might have something to fear from unnecessary enforcement of site protection law, despite assumptions to the contrary. The case involved a highly respected entomologist, who was doing a survey of a Biodiversity Action Plan priority species under a 'Lead Partnership' with English Nature (EN: the statutory conservation agency for England). The site was an SSSI owned by the Ministry of Defence (MoD). The entomologist held an MoD letter of permission, issued in 1998 and valid from 1999 onwards. He had obtained this so as to satisfy not only the bylaws of the MoD, but also a requirement that Lead Partners in Biodiversity projects with EN are required to have permission from the landowners of all sites where they intend to conduct their proposed fieldwork. He also held a postcard from EN, acknowledging that he had notified EN's local office of his intention to work at the site concerned.

The problem for the entomologist began when a police constable employed by the MoD challenged him for carrying a net on MoD land. He felt confident in the knowledge of possessing the above papers and in recollecting that the MoD's letter of permission stated that his work did not require a permit anyway. (The letter had been issued on the basis that EN approved of the work and had notified MoD accordingly.) Unfortunately, on trying to produce the papers, the entomologist discovered that he had forgotten to bring them to the site. Under further questioning, he did, however, provide a full explanation of his



activities on the site and he allowed the constable to search the boot of his car so as to prove that no specimens had been taken. Despite this co-operation, during which the entomologist offered to present his papers later at a police station, the constable still seemed to have concerns, and he subsequently took these up with the local office of EN.

Despite EN's initial involvement in securing MoD permission for the entomologist's fieldwork, the local EN office was evidently unable to find the relevant records. Some time after the incident, the entomologist received a peremptory e-mail message from EN headquarters asserting that he had failed to obtain MoD permission for the survey work and informing him that the MoD had therefore banned him from the site. The message did not refer to the fact that EN had co-operated with MoD to secure permission for the work to be done from 1999 onwards. In any case, however, it seems that the permission was overridden by the new legislation of 2000, under which the entomologist should have applied for a new MoD permit for work on an SSSI. The MoD would then have had to obtain authorisation from EN before issuing the new permit.

This all happened a few months ago and we are pleased to report that relations between EN and the entomologist have happily been restored. It is, however, of concern that someone acting in all innocence and in accordance with instructions previously received from MoD should be subjected to such harassment, even if the subsequently revised law and local MoD bylaws were technically against him. On the other hand, anyone who had no permission at all would be aware from on-site notices that MoD bylaws applied, even though there would be nothing to indicate the SSSI status of the site. Perhaps we have to accept inappropriately drafted legal controls, but we then need to be confident that those controls will not be inappropriately applied.

### **RSPB Big Bug Count results**

*ICN 44* carried an item about the 'Big Bug Count', organised in Britain this year by the Royal Society for the Protection of Birds. The idea for the survey was based on the common perception that the number of insects found on the fronts of cars has declined in recent years. The RSPB is concerned about the conservation of insects in their own right but its primary concern is that a decline in insect populations is bad for the many species of bird that depend on them as a food source – either as the main part of their diet or as food for their chicks. Swallows



*Hirundo rustica* and House martins *Delicon urbica* are specialist insect feeders but seed eating birds, such as skylarks *Alauda arvensis* and House sparrows *Passer domesticus*, also need insects to feed to their young. Many of these species have declined in recent years; for example house sparrow numbers have fallen by 65% in the last 31 years.

Members of the public were invited to count splattered insects on their vehicle number plates during journeys they would normally make during in June 2004. They were issued with instructions, so as to ensure that they would all use the same sampling methods, and with a free sampling grid (the 'Splatometer®'). There was a decision to count insects on the number plate because it is a vertical surface, in a similar place on most vehicles, which has a relatively undisturbed airflow, so giving the greatest consistency between different vehicles. Obviously, car aerodynamics and the relatively small size of the splatometer mean that not all insects on a route would be 'splatted' However, this approach gives an index which can be compared between regions and over time.

After the survey, the RSPB reported that there had been nearly 40,000 participants, many of whom are said to have been astonished by how few insects they had counted. A total of 324,814 insects were counted at an average rate of only one 'splat' every five miles (8.3 km).

Richard Bashford, RSPB's Big Bug Count co-ordinator, said: "The main aim of the survey was to form the baseline against which we would compare data from future years. Although variation in insect numbers across the UK was small, there appears to be a gradual increase in numbers from the south east of England to Scotland. The reasons for this, and the potential consequences for birds, will be the focus of future research. Because this is a new survey, we can't show for sure that insects have declined. However, in order to see if there are any changes in insect populations in the future, the RSPB will repeat this survey. In time we will be able to compare these results with those from our bird monitoring to see if there are any links."

The RSPB points out that, in addition to its own Big Bug Count survey, there are other major long-term insect surveys in the UK. Rothamsted Research runs a series of large traps that suck insects from the air, with a focus on aphids. Also, the Rothamsted Insect Survey runs a network of light traps to look at moth populations across the country. Butterflies are monitored nationally by the Centre for Ecology and Hydrology butterfly monitoring scheme. Previous research has already shown local links between suction trap catches and the health of bird populations.





The RSPB intends to repeat the survey in future years and hopes that the results might shed light on the reasons why there may be fewer insects around, while perhaps also indicating whether wildlife-friendly gardening and the new national agri-environment schemes are helping insect populations. Further information on the survey can be obtained from: Caroline Osborne, RSPB press officer, (tel. 01767 681577 or Mobile: 07743 841440) or Richard Bashford, Big Bug Count co-ordinator (tel. 01767 680551).

### **Wildlife Trusts' Invertebrate Network UK**

In ICN 44, we reported that The Wildlife Trusts' Invertebrate Network (WIN) is the e-mail-based successor to the Invertebrate Specialist Group (ISG) of the Wildlife Trusts. Martin Harvey, the contact person for WIN, has now written to give his full contact details, which are as follows:

Martin Harvey, Hampshire and Isle of Wight Wildlife Trust, Beechcroft House, Vicarage Lane, Curdridge, Hampshire SO32 2DP Tel – Direct dial: 01489 774420; Switchboard: + 774400; Mobile: 07970 564532) Fax: 01489 774401 email: MartinH@hwt.org.uk home email: martin@kitenet.freeserve.co.uk



## **SITES AND SPECIES OF INTEREST**

### **Glow-worm survey in Scotland**

Earlier this year, Jonathan Willet of North Lanarkshire Council announced a Scottish Glow worm survey for 2004. Although it is now too late in the year to see adult glow-worms *Lampyrus noctiluca* in Britain, readers may be interested in the survey, which will presumably have a follow-up in future years. Jonathan wrote that there were not many recent records for this species, these being mainly from the 1970s and a few from the early 1990s, mainly in Argyll, Strathclyde and Galloway. It is thought that glow-worms are declining in Scotland but this is not known for sure. Jonathan has pulled together all the available records from the Centre for Ecology and Hydrology, Monks Wood so as to provide a starting point for re-survey of historic sites. He comments that glow-worms are certainly under-recorded in Scotland, so that there is a lot of scope to get new records. He can be contacted at: willetj@northlan.gov.uk



### **Rare dragonfly threatened by introduced fish**

The Environment Agency (England and Wales) has issued a statement, written by Oliver Blackburn, about an illegal release of carp threatening a population of the Downy emerald dragonfly *Cordulia aenea* at Berrington Pool, a Site of Special Scientific Interest near Shrewsbury, Shropshire. Oliver Blackburn writes that *C. aenea* is particularly rare in that part of Shropshire. The fear is that, by rooting for food in the margins of the pond, the introduced carp might consume dragonfly larvae, which live in leaf litter at the edges of the pool and perhaps with significant effects on the dragonfly population.

When members of the local angling club discovered the carp, they contacted the Environment Agency and English Nature, who advised them what to do. They have so far captured 19 carp, each weighing between 7 and 17 lb (3 to 7.5 kg), transferring them to holding tanks and then moving them to more appropriate sites. The anglers hope to catch the remaining carp in the next few months and return the pool to its original state, but they can never be 100% certain that all will have been removed.

Fisheries Officer Andy Roberts has pointed out that it is illegal to introduce any fish or fish spawn into a lake or watercourse in England or Wales without prior written consent from the Environment Agency. This requirement is laid down under Section 30 of the Salmon and Freshwater Fisheries Act (1975), and also under Section 14 of the Wildlife and Countryside Act 1981, which makes it an offence for any person to release or to allow the escape into the wild any animal not ordinarily a resident or a regular visitor in the wild in Britain. Oliver Blackburn can be contacted at: [oliver.blackburn@environment-agency.gov.uk](mailto:oliver.blackburn@environment-agency.gov.uk)

### **Undesirable ladybird introduction**

The Harlequin ladybird or Multi-coloured ladybug *H. axyridis* was found in the UK for the first time on 19th September 2004, by Ian Wright, a colleague of the ladybird specialist Dr Michael Majerus of Cambridge University. This discovery, in Sible Hedingham, Essex, was followed by reports from London boroughs, well to the south-west, and also from Canterbury in Kent, well to the south-east. These widely scattered sightings suggest more than a localised introduction of this Asiatic species.

Although many ladybird species have a beneficial role in helping to control aphid populations, the establishment of *H. axyridis* as an alien



in North America has been followed by steep declines in the populations of the native ladybirds of North America, partly due to competition. Also, when short of food, *H. axyridis* has been found to prey upon eggs or larvae of insects other than aphids, including butterflies, lacewings and other ladybirds. It has reportedly become by far the commonest ladybird in many areas of the USA and is becoming so in parts of Canada.

Another problem, now common in America, is that, when preparing for hibernation, the Harlequin makes a nuisance of itself by entering people's houses in vast numbers and also by damaging grapes and other soft fruits in search of juices. Despite its unwelcome and well-publicised track record, *H. axyridis* is still sold in continental Europe by biocontrol companies and now occurs in increasing numbers across France, Belgium and Holland.

Despite circumstantial evidence that *H. axyridis* is already breeding in south-east England, the chances of its becoming established or of causing as much harm as in the USA are uncertain. In response to AES Internet Forum discussions, Dr. John Muggleton has commented that it failed to become established in California and Hawaii, where it was first introduced as a biological control agent in 1916. He adds that many later attempts to establish it in N. America, Central Asia and Europe were mostly unsuccessful. He suggests that there may be something atypical about its more recent aggressive spread through the eastern states of the USA, which began following its establishment in Louisiana from an unknown source in 1988, possibly a casual importation.

John makes the interesting observation that the common European *Coccinella 7-punctata* (7-spot ladybird) was introduced into the same part of the USA and similarly ran amok, apparently causing the decline of some native species. He sees a possibility, but not a certainty, that *H. axyridis* will become established in the UK, but that it would probably be exposed to the parasites and other natural enemies of the genus *Harmonia*, which is Palaearctic in distribution.

*Harmonia axyridis* is similar in size to *C. 7-punctata* but often has more black spots and a generally larger proportion of black on the elytra. The markings are, however very variable, ranging to a form with completely melanic elytra. It differs from *C. 7-punctata* in that its prothoracic black area forms a 'W-shape' in between the white markings. John Muggleton has pointed out that its non-melanic varieties could be confused with its continental European counterpart *Harmonia 4-punctata*, which was first found in the UK in Suffolk in 1939 and has since been spreading through England and has reached Scotland and Wales.





Reg Fry, for the AES Internet Forum, has made available a picture at the following web addresses: <http://groups.yahoo.com/group/aes/files/Harlequin.jpg> and <http://groups.yahoo.com/group/aes/files/Harlequin2.jpg>. Also, Reg has found a picture showing the wide range of forms at: <http://ipmofalaska.homestead.com/files/Harmoniaaxirides.jpg>. Further information should soon be available from a UK-based website at: [www.ladybird-survey.pwp.blueyonder.co.uk/H\\_axyridis.htm](http://www.ladybird-survey.pwp.blueyonder.co.uk/H_axyridis.htm). Anyone in the UK who discovers any ladybird that answers the description of *H. axyridis* is requested to contact Dr Michael Majerus, Department of Genetics, University of Cambridge, CB2 3EH (Tel: 01223 356372 or 01223 276190 or Mobile 07973 290059; Fax: 01223 333992; e-mail: [m.majerus@gen.cam.ac.uk](mailto:m.majerus@gen.cam.ac.uk)). Records in London and Essex can be sent to: Paul Mabbott, 49 Endowood Road, Sheffield S7 2LY (e-mail [mabbott@blueyonder.co.uk](mailto:mabbott@blueyonder.co.uk)).

### Survey of the Noble chafer in the UK

The Noble chafer *Gnorimus nobilis*, a metallic bronze-green beetle which is about 2 cm long, depends on the availability of decaying ancient fruit trees in old orchards, in which its larvae develop. Its current Red Data Book classification in the UK is 'Vulnerable' and it is a Biodiversity Action Plan (BAP) Priority species, with the People's Trust for Endangered Species (PTES) as the Lead Partner. The PTES has provided a picture of *G. nobilis* on its website at: [http://www.ptes.org/BAPs/images/Noble\\_Chafer\\_Fact\\_File.pdf](http://www.ptes.org/BAPs/images/Noble_Chafer_Fact_File.pdf).

Many populations of *G. nobilis* have been lost due to the grubbing up of increasingly uneconomic old orchards. This practice remains of serious concern, not only regarding the survival of *G. nobilis* but also that of other saproxylic species. The PTES says that, for example, between 70% and 85% of the old orchards in Worcestershire and Gloucestershire have been destroyed over the last 40-50 years.

Under PTES leadership, the Noble Chafer BAP group was formed in 1999, with a key objective being to find how many beetle populations remain in Britain and to identify the key sites. From the start of formal recording in 1980 to the group's formation, *G. nobilis* had been recorded in only ten 10-km squares (hectads) in Britain, but a further ten hectads have since been added, partly through surveys that PTES has commissioned from specialists by PTES, aided by funding from English Nature. The majority of records have come from the main fruit-growing regions of Worcestershire, Gloucestershire and Herefordshire, with some outlying populations in south Oxfordshire and the New



Forest. There are no post-1980 confirmed records for Kent, although the chafer was reported there in the 1940s.

Although the adult beetles can be found feeding on flowers, they have proved elusive. Thus it was decided in 2003 to look mainly for signs of the larvae in host trees, as shown by the presence of their very distinctive droppings. This approach proved very successful in surveys in Worcestershire, Gloucestershire and Herefordshire. In the Wyre Forest District of Worcestershire, evidence of the beetle was found in 16 of 26 orchards surveyed. Sightings of adults by members of the public are also being sought, following the acquisition of a new 10-km square record on this basis in 2001.

Anyone who is interested in assisting the survey is requested to send a stamped addressed envelope to PTES, 15 Cloisters House, 8 Battersea Park Road, London SW8 4BG.



## FUTURE UK MEETINGS

**London:** Ecology & Conservation Studies Society –Spring 2005 lecture series, “A Taste of Invertebrates” Venue: room B29, Senate House, Malet Street, London WC1E. Nearest Underground Stations: Euston Square, Tottenham Court Road, Goodge Street or Warren Street.

The society is affiliated to Birkbeck College, London, and supports the college's ecology and conservation certificate and diploma courses. The lectures last from 6.30 to 8.30 p.m., with a short break after the initial delivery and closing with a question and answer session. Fees are payable: please apply for details to Ken Hill, 93 Elmhurst Drive, Hornchurch, Essex RM11 1NZ (Tel. 01708 456652 e-mail: ken@kenneth17.fsnet.co.uk)

**4 February:** Bees, Wasps and Ants by Mike Edwards – Consultant Entomologist and National Co-ordinator of the Biodiversity Action Plan, Survey of Bees and Wasps for the UK

**11 February:** Invertebrate Conservation in Woodland by Dr. Roger Key – Invertebrate Ecologist with English Nature.

**18 February:** Invertebrates of Brownfield Sites by Peter Harvey – an Environmental Consultant specialising in Spiders, Bees and Flies.

**25 February:** Britain's Rarest Mollusc by Dr. Martin Willing – Conservation Officer of the Conchological Society.

**4 March:** Coastal Invertebrates by Dr. Chris Gibson – Head of the Colchester Office of English Nature.

**11 March:** Cousins to the Insects – Many Legged Beasts by Tony Barber – a part-time lecturer at College of St. Mark & St. John, Plymouth and current chairman of the Myriapod and Isopod Study Group.

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# Invertebrate Conservation News

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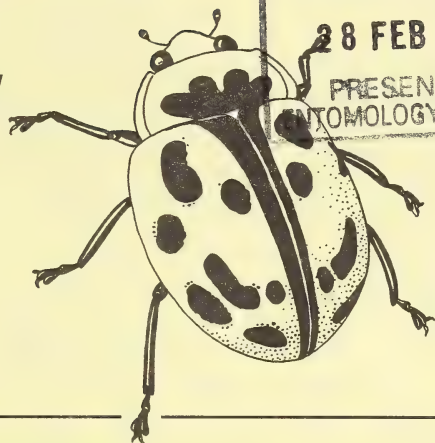
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# INVERTEBRATE CONSERVATION NEWS



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## EDITORIAL

Even the most ardent entomologist would probably not deny that insects can occasionally be a nuisance, at least in the perception of people whose sympathies are not entomological. There may, therefore, be some justification in the inclusion of 'nuisance insects' as one of the targets of proposed UK legislation under the Clean Neighbourhoods & Environment Bill. The intention is to empower the authorities to act against the owners of premises from which such insects are emanating, but such legislation could be abused so as to cause unnecessary harm to invertebrates and their habitats.

Although the Clean Neighbourhoods & Environment Bill seeks to exempt certain protected species from the proposed eradication measures, it shows some signs of pandering to the perception of invertebrates as pests. There is perhaps an indication of a biased mindset in the fact that the Bill fails to include any mention of 'nuisance birds' or 'nuisance mammals', even though such things clearly exist. Moreover, of the 1037 organisations that were consulted on the Bill, only three were primarily concerned with wildlife conservation and one with invertebrates.

It seems likely that none of those responsible for the above Bill had many positive attitudes about invertebrates. Human attitudes to everyday things tend to form early in life, and so young people should have invertebrates portrayed to them in a positive way. In Britain, this seems to be happening much more in schools and through the work of organisations like the wildlife trusts than perhaps was the case twenty or more years ago. On the other hand, children tend less than formerly to develop their own interests in invertebrates away from the classroom or to join natural history societies when they grow up. It is sad to see





an apparent decline in the sort of informal study which, for many people of earlier generations, has underpinned a lifelong fascination.

Books and other educational media can of course play a very important part in promoting youngsters' interest in invertebrates. It is very encouraging to see that there are nowadays some very attractive and informative children's books on various aspects of studying invertebrates. Sometimes, however, authors and other educators could do better in imparting information, so that young people will gain an idea not only of the fascination of invertebrates but also of their diversity and their importance to all other life on the planet.

One recently published booklet on the identification of 'minibeasts' is, according to reviews, a very useful guide, which will help to enthuse children about invertebrates and to help them (with adult assistance) to identify the main kinds that they are likely to encounter. It is, however, a little disappointing to read the following description of invertebrates in the blurb which accompanies the booklet: "*They differ from the rest of the animal kingdom in lacking an internal skeleton and in particular a backbone.*" This is a true statement, but it perpetuates a misplaced perception about invertebrates versus vertebrates. It would surely be far more intriguing, exciting and informative to tell a young readership that the vast majority of the world's animal species are invertebrates and that vertebrates comprise just part of one of the main principal groupings (phyla) of the animal kingdom.

Pretty pictures of invertebrates probably do a lot to improve readers' attitudes, especially when they are accompanied by useful information about the ecological importance of invertebrates and about the enhancement of back-garden habitats. Organisations that publish such images are doing a great job but, in their desire to please their readership, they sometimes shy away from potentially uncomfortable and commercially unpalatable issues. For example, the artificial feeding of birds is almost universally portrayed not only as the very enjoyable garden activity that it is, but also as a laudable and wildlife-friendly activity, despite the suspicion that it could lead to excessive predation of some invertebrates. The rescue of wildlife from destruction is another popular activity that can entertain more than it enlightens. For example, the recent translocation of some slow-worms from a soon-to-be developed brownfield site has recently been praised without any mention of the wildlife habitats that were still destined for obliteration.

Over 35 years ago, in the early days of the bulletin that preceded *ICN*, the need to encourage better attitudes towards invertebrates (or at least insects) was one of our main themes. We challenged the



perception of most kinds of insect as pests, and we saw early signs that, despite this pest and creepy-crawly image, the collecting of specimens was being perceived as a wicked activity that should be criminalised. A lot has changed since then, but old prejudices die hard and some even gain respectability!



## NEWS, VIEWS AND GENERAL INFORMATION

### **Nuisance Insects”: UK legislation**

A little-publicised UK government Bill with potentially damaging effects on insects has recently come to our attention. The Clean Neighbourhoods & Environment Bill includes a clause that would enable action to be taken against the owners of premises that were considered to be a fertile breeding ground for any insects “emanating from industrial, trade or business premises and being prejudicial to health or a nuisance” Such cases would come under the legal definition of statutory nuisance. We understand that the above premises would include agricultural land, and so the effect of the new law would range much more widely than, for example, the illegal storage of insect-infested slaughterhouse waste.

The law would be wide-ranging also with regard to the types of insect that could be affected. Exemption would apply only to some of the species protected under Schedule 5 of the Wildlife and Countryside Act 1981, not including those that are protected only from unlicensed trading. Clearly, there is cause for concern that the new law could be mis-used in ways that could cause unnecessary harm to insects and their habitats.

Another provision of the Bill, which could cause some concern, is that it would also apply to artificial lights (except for many categories such as street lights). This could be good news if outdoor insect electrocution traps were to be targeted as a nuisance, but perhaps less good news for entomologists operating light traps.

The only other provision of the Bill that could conceivably affect the activities of naturalists would be the empowerment of local authorities to close public footpaths, either permanently or for certain periods, by means of gates. The intention is to deny hooligans access to back-



alleys, but some of the footpaths affected could be the only reasonable means of walking to biologically interesting sites. Indeed, some paths are interesting in their own right, as they support wild plants ('weeds' in the eyes of the authorities perhaps) and their associated invertebrates. Such informal wild places can inspire young naturalists and so it would be sad if they were to be placed out of bounds.

It is interesting to note that the new law would establish the Commission for Architecture and the Built Environment (CABE) on a statutory basis. CABE was the organisation that recently ran the 'wasted space' campaign, in which people were invited to nominate sites that should be put to better use. Unfortunately, CABE did not seem very aware of the great biological value of many brownfield sites, and so there would be an increased need to engage constructively with CABE if it were to become a government body.

Although over a thousand organisations were invited into the consultation process, these did not include any of the invertebrate societies and so the consultation was over by the time that we were alerted to the contents of the Bill. Meanwhile, the Royal Society for the Promotion of Health had asked for the nuisance insect clause to be strengthened, but other respondents had expressed mild concern; especially that bee-keeping and use of insects for research, farming and horticulture should be exempted from any new provisions. In any case, the government decided to press ahead with the 'nuisance insect' clause without any amendment.

Despite the lack of consultation with invertebrate bodies, Matt Shardlow of Buglife – The Invertebrate Conservation Trust has written to Sue Doughty MP, suggesting a simple amendment, which could help to ensure that the law against nuisance insects would not be applied to farmland or other areas that are not truly industrial. Meanwhile, efforts are being made to advise the relevant government department that appropriate guidelines should be applied, so that the new law will not be abused.

### **Review of the list of species protected in Britain**

As reported in *ICN* 38, UK naturalists have been awaiting the outcome of the latest quinquennial review of the Wildlife and Countryside Act 1981. As anticipated, three species are shown for potential addition to the protected list: the Roman Snail *Helix pomatia* to be considered in respect of taking, killing, injuring and sale, and two burnet moths recommended for full protection; the Talisker Burnet moth *Zygaena lonicerae jocelynae* and the Slender Scotch Burnet moth *Z. loti scotica*.





In the UK, *Z. loti* is now found only on the islands of Mull and Ulva but neither of these moths has previously been regarded as requiring legal protection. An incident involving the possession of large numbers of specimens of these subspecies seems to have led to the recommendation for full protection, but the rationale for this is being considered by the invertebrate organisations through Invertebrate Link. The Roman snail remains locally abundant on parts of the North Downs and elsewhere in southern Britain, but some populations seem to have been harmed or even destroyed by culinary collection.

### Urban garden biodiversity study

As discussed in *ICN* 33 (Oct. 2000), wildlife habitats in urban gardens are being increasingly destroyed and damaged, at least in the UK. New housing developments usually have a far smaller proportion of green space than old ones, while many of the old ones are being redeveloped by means of back-garden infill. Also, mechanised construction methods very often completely destroy all the pre-existing biodiversity on a site.

As garden green space dwindles, some of us have tried to seek comfort in the idea that many of the gardens that are being redeveloped are perhaps no great loss, having been too neat and tidy for much wildlife to have survived in the past. It seems, however, that there is considerable wildlife habitat even in gardens that might seem very neat, tidy and stocked with alien plants. This finding comes from "BUGS": the Biodiversity in Urban Gardens project at Sheffield University in South Yorkshire. The BUGS Newsletter No. 3, March 2004, includes a report on invertebrates that were identified in various garden samples. The study focussed on thirteen major taxa: molluscs, millipedes, centipedes, woodlice, hoverflies, bumblebees, craneflies, sawflies, true bugs, solitary bees and wasps, beetles and spiders.

The data showed a lot of variation between individual gardens, some of which was clearly associated with local features. For example, gardens with a wide range of habitat features, or lying close to substantial areas of green space, supported a relatively good range of bumblebee species. Not all taxa showed such obvious relationships but invertebrates as a whole showed more diversity where there was plenty of vegetation and where the vegetation varied in height. Despite concerns about urban green space being increasingly built on, it is interesting that the study found little evidence to support common ideas such as larger gardens being better, or gardens in more urban areas being less good than those in the suburbs.



## National macro-moth recording scheme for UK

For several years, Butterfly Conservation (BC) has been developing a partnership of organisations and individuals with a view to setting up a national recording scheme to cover the 800 or so British species of macro-moth. During 2003 and 2004, BC conducted a planning phase with the help of contractors Adrian Spalding and Mark Tunmore. This involved extensive consultation with the existing moth recording community and with many nature conservation and biological recording organisations. It is intended that individual recorders will retain ownership and legal rights over their records, but that the use of those records will be subject to an agreement, allowing certain levels of access to user groups. Meanwhile, recorders are being encouraged to continue sending their records to the existing county and other schemes.



## OBITUARY

### Dame Miriam Rothschild

Dame Miriam Rothschild, a well-known entomologist and practitioner of wildlife conservation, died in January at the age of 96. Although largely self-taught, she did much well-acclaimed research in a variety of scientific fields, publishing over 300 papers and several books. Her best known work involved fleas in relation to their vertebrate hosts and followed the work of her father Charles, who was a banker by profession but had a great interest in natural history and became an expert on fleas. She maintained her research interests well into her nineties, and it was announced only recently that she and her co-worker Robert Nash had found that a proportion of larvae of the Peacock butterfly *Inachis io* are able to sequester a pyrrolizidine alkaloid, possibly from fungi associated with the foodplant, which protects the larval colony against predation.

Dame Miriam shared her father's interest also in nature conservation. He founded the Society for the Promotion of Nature Reserves (now the Royal Society of Wildlife Trusts) and she became well known for her work on the re-creation of wildflower meadows, which she pioneered at her own garden, at Ashton Wold, near Oundle in Northamptonshire. Like others, however, she came to realise that nature reserves were not enough on their own and she supported the view that the conservation of wildlife depends very much on the sympathetic management of the surrounding farmland.



## SITES AND SPECIES OF INTEREST

### Threats to Field cricket and other rare Orthoptera at a Belgian brownfield reserve

In an article published by the University of Gembloux, Belgium, Manuel Maingeot has reported the results of a study of Orthoptera at a brownfield site at Sclaigheaux in the Seilles area. The site lies between a factory and a main road and has in the past been used as a waste tip as well as being frequented by naturalists, poachers and motorbike scramblers. Part of the area has been planted with conifers. It is clearly a very interesting site since, within an area of 60 ha (148 acres), it supports 20 species of Orthoptera, including the endangered Field cricket *Gryllus campestris*. Other notable species include The Great Green bush cricket *Tettigonia viridissima*, the Blue-winged grasshopper *Oedipoda caerulescens* and the Lesser Mottled grasshopper *Stenobothrus stigmaticus*.

Half of the Orthoptera at Sclaigheaux, including the Field cricket, occur on an area of grassland adjacent to a main road. This area is classed as contaminated land, but the author considers that any attempt to decontaminate it would endanger the invertebrate populations.

In 1974, groups of naturalists eventually succeeded in persuading the local authority for Seilles to take some action to protect the site, but it received only 30 years' partial protection as a local nature reserve. In 1980 the designation was renewed but, at the time of drafting the article in 2002, the author was concerned about the future of the site. The existing designation had failed to prevent various kinds of damage to the habitats, and the prospects for any further protection were doubtful as there was a need for approval not only by the local planning authority, but also by the Belgian Forestry Commission, which had designated parts of the site for the establishment of additional conifer plantations.

### Reference

Maingeot, M. (2003). Etude des populations d'orthoptères de la réserve de Sclaigheaux. *Notes Fauniques de Gembloux* **50**, 63-74.

### Special action for a butterfly in Durham, NE England

The Durham Wildlife Trust has made its first venture into developing a nature reserve specifically for a single species by acquiring a lease on Longburn Ford Quarry next to the A68 road. As reported in the winter/spring 2005 edition of the Trust's magazine, the new reserve will





be managed so as to enhance the populations of the Small Pearl-bordered Fritillary *Boloria selene* in the area. The Trust is also raising funds to pay for fencing and interpretative panels at the site. The species is rare and declining in the region and has 'high priority' status in the Durham Biodiversity Action Plan.

As a pragmatic solution to the plight of this species, there is probably a need to manage some sites specifically for its benefit. Indeed, the management of sites with certain species in mind can be of benefit to many others, for example in the case of ride widening in woodlands. If, however, 'gardening' for individual species or a small suite of species becomes a major part of an organisation's conservation activity, it may distort priorities for the use of resources and may obscure a proper rationale for land management. It may also cause undue harm to the habitats of other species.

### **Habitat requirements of Yellow Lunar Underwing moth**

According to the 2003-2004 *Lepidoptera Conservation Bulletin*, published by Butterfly Conservation (BC), field studies in Norfolk and Suffolk, eastern England have revealed some interesting requirements of the Yellow Lunar Underwing *Noctua orbona*. A study by Gerry Haggett in the Breckland showed that the larvae of the moth in that area require a sward length of at least 15 cm and that they are intolerant to heavy grazing or swiping.

In the Breckland, the main foodplants were Sheep's fescue *Festuca ovina* and Wavy Hair-grass *Deschampsia flexuosa*, but a parallel study in the Suffolk Sandlings, by the Suffolk Moth Group, led by Tony Prichard, showed that some of the larvae were feeding on species of Bent-grass *Agrostis* spp. or on Soft-grass *Holcus* spp. Another difference, compared with the Breckland data, was that some of the Sandlings populations occurred on very short rabbit-grazed grassland. The studies were supported by Forest Enterprise and English Nature.

### **Fen raft spider: new discoveries in SW England and Wales**

When the Fen raft spider was first listed for protection in Britain, under the Wildlife and Countryside Act 1981, the only known British populations were on the margins of peat pools at Redgrave and Lopham Fen, at the source of the River Waveney on the Norfolk/Suffolk border in East Anglia. (The Fen is now managed by Suffolk Wildlife Trust as a nature reserve, together with some recently acquired adjacent



land, that serves as a buffer area.) The spider was first recorded at the Fen in 1956 by the eminent arachnologist Eric Duffey. It was not until 1988 that a second UK population was recorded, when Peter Kirby identified *D. plantarius* in grazing marsh ditches on the Pevensy Levels in East Sussex, SE England. Before this record, the species had evidently been present in the area since at least the 1950s, although not identified as such.

As reported by the Countryside Council for Wales, *D. plantarius* was discovered at a third UK site in 2003, when local naturalist Mike Clarke identified it on the disused Tennant canal near Swansea, South Wales. Mike Clarke also found some young *Dolomedes* at a nearby site on Crymlyn Bog National Nature Reserve, but these were too immature to be identified to species level. Recently, the Wildlife Trust of South and West Wales has reported that the spiders have been confirmed as *D. plantarius*. A previous indication that the species was present at this site had come from an unconfirmed report by Jonathan Lees in the 1970s. Mike Clarke has since found another juvenile *Dolomedes* at yet another site, Red Jacket Fen, which the Trust has recently acquired.

Another discovery of *D. plantarius*, this time in SW England, has been reported by the Devon Wildlife Trust, at its Venn Ottery nature reserve, a lowland heath in East Devon. The known British sites where this species occurs remain very few and scattered but, due to a lack of any reliable historical records, it is impossible to know whether it has always been so rare and localised. The likelihood is that it was previously more common, especially within ditch systems in lowland grazing marsh but has died out in many sites due to habitat loss and degradation.

### **Military developments and the Heath Fritillary, NE England**

The UK Ministry of Defence (MoD) has been developing new facilities at the largest of its artillery ranges in Britain; Otterburn, Northumberland. Among the developments are widened roads, an accommodation block and hard standing areas, including 50,000 m<sup>2</sup> of concrete paving. The MoD is well aware of the need to safeguard biodiversity while developing its new facilities. For example, an article in the 2003/4 annual report of the Army Training Estate states that half of the UK's population of the Large Heath butterfly *Coenonympha tullia*, occurs within the Northumberland National Park, which contains the Otterburn Range.

According to the 2003/4 report, construction has been done so as to ensure protection of the bogs where larvae of the Large Heath feed on



Cotton grass *Eriophorum* spp. and where the adults visit the flowers of the Cross-leaved Heath *Erica tetralix*. However, the plans for military development met some opposition when they were announced several years ago. In September 2000, the Council for National Parks (CNP) warned in a press statement that the development of new infrastructure would "open the floodgates to a host of other damaging activities that will follow closely behind." CNP's main concern was, however, that the plans conflicted with the safety and enjoyment of users of the Northumberland National Park, and that they were in any case unnecessary on military grounds.

### News of rescue mission for rare ant in Devon

As reported in *ICN* 23 (June 1997), there was a rescue mission in SW England, involving the translocation of seven nest mounds of the ant *Formica exsecta* (the 'Narrow-headed ant'). This UK Red Data Book species is mainly confined to the Bovey Basin in Devon and to a few Scottish sites in the Aviemore and Rannoch areas. The mission was mounted because nests of the ant had become threatened by unofficial motor cycle scrambling at one of the Devon sites; Bovey Heathfield. The Devon Wildlife Trust took over the 50 acre (20 ha) heathland site as a nature reserve in September 2002, in an effort to stop the motor bike scrambling, and has since been organising biological recording there. In the Trust's autumn 2004 magazine, it was reported that the ant had been returned from its temporary home (at Paignton Zoo) in March 2004.

Other noteworthy invertebrates which have recently been recorded at Bovey Heathfield include the Bog bush cricket *Metrioptera brachyptera*, the Bee wolf *Philanthus triangulum*, the Keeled Skimmer dragonfly *Orthetrum coerulescens* and the Dotted Chestnut moth *Conistra rubiginea*. The Bee wolf, a ground-nesting wasp, has become much more common in England in recent years, but it is of interest in relation to the Bovey Heath story because of its requirement for bare ground for nesting. Bare ground is vital for many solitary bee and wasp species but it is in short supply on some sites, and so there can be some benefit in human activities that cause a certain amount of erosion. Motorbike scrambling can of course be very excessive in this respect, but the Devon Wildlife Trust will need to assess whether Bovey Heath will retain a reasonable amount of bare ground, now that this activity has been stopped.





## Conflict over large-scale pesticide spraying in Idaho, USA

The Xerces Society, together with other conservation bodies, has met with some success in preventing the spraying of pesticides across vast areas of Idaho, USA. Idaho farmers periodically face potentially serious crop damage by various species of grasshopper and the Mormon cricket *Anabrus simplex*. The Mormon cricket breeds mainly in rangelands but is migratory and sometimes devastates crops in arable areas. It is, however, a large flightless species, which can migrate to susceptible crops only via the ground, and so can be intercepted by the use of poison bait, without the need for spraying.

The grasshoppers, which include *Aulocara ellioti*, *Oedaleontus enigma*, *Camnula pellucida* and *Melanoplus* spp., can evade poison bait by flying. Thus spraying with carbaryl, malathion and diflubenzuron is the preferred means of controlling the grasshoppers, but the authorities have a system whereby they restrict the treatment to areas where a problem exists and also leave strips of ground untreated so that non-target invertebrates can survive.

Despite the precautionary system, a environmental assessment from the U.S. Department of Agriculture in 2004 cleared the way for spraying on virtually all areas which might be the source of outbreaks. This could include nearly 20 million acres (81,000 km<sup>2</sup>) in southern Idaho, including wilderness areas, wilderness study areas and other sensitive ecosystems.

The Xerces Society and other environmental groups pointed out that it is clearly very undesirable in principle to spray large areas of land with pesticides, even if some areas are left untreated. They argued that the chemicals would damage water quality and harm wildlife, including endangered species. In response, the USDA withdrew its plan to spray pesticides in 2004, so that only the use of carbaryl bait was permitted. There was also a prohibition on the use of pesticides in wilderness and wilderness study areas.

## London habitats under threat from Olympic Games?

Of the various reasons why some people do not favour London's bid to host the 2012 Olympics, concern about wildlife habitats has not figured very prominently. Such concern, especially regarding the important brownfield and greenfield habitats in London's lower Lea Valley, has been expressed by the London Wildlife Trust. Anyone who knows the area will be aware of the wealth of wildlife that has managed to survive in this predominantly urban area. Those responsible for making the bid



were clearly aware of green issues, but they focussed mainly on the benefits that would accrue from schemes such as the enhancement of public transport. They gave some lip service to the protection of wildlife, but this was couched largely in terms of landscaping and tree planting.

If London proves to be successful in its bid, habitats and opportunities for informal enjoyment of nature will be lost, but there may be scope for mitigating the loss and perhaps creating new habitats.



### **The Striped *Lychnis* moth in southern England**

An article in the 2003-2004 *Lepidoptera Conservation Bulletin*, published by Butterfly Conservation (BC), suggests that the Striped *Lychnis* moth *Sbargacucullia lychnitis* is maintaining and even slightly increasing its range across the southern English counties of Hampshire and West Sussex. In a survey during August 2003, larvae or signs of larval feeding on Dark mullein *Verbascum nigrum* were found at 35 sites on a broad band between Andover to Chichester. The possible slight expansion of the range included an area of western Hampshire, close to the Wiltshire border. At the other end of the range, a discovery of some larvae during a Butterfly Conservation field meeting indicated that the species might be more widely distributed in the South Downs than has been previously supposed.

Despite the fairly reassuring results of the survey, many of the colonies were restricted to very small sites and some of those previously recorded seemed to have died out due to inappropriate mowing of roadside verges. Hampshire County Council has been co-operating with BC in a series of roadside management trials, in which cutting is done in April and September, allowing Dark mullein to regenerate, flower and set seed.

The moth has another stronghold further north in England, in the county of Buckinghamshire. One of its sites was overgrazed in 2002, but the habitat has since benefited from inclusion in a Countryside Stewardship Scheme and was supporting over 900 larvae in 2003.



## RESEARCH NOTES

### Analysis of extinction rates

In March 2004, Jeremy Thomas of the UK's Centre for Ecology and Hydrology and a group of co-workers published an article which showed that butterflies have been undergoing local extinction within Britain (and also national extinction) at a higher rate than birds and plants. They made the comparisons mainly by analysing the numbers of 10-kilometre squares that were recorded as being occupied by butterfly, bird and plant species over two periods: 1954 to 1960 and 1987 to 1999.

The team found that 28% of native plant species have decreased in their distribution over the past 40 years and that the corresponding figure for native birds over the past 20 years is 54%. Butterflies fared the worst of the three groups, with 71% of British species showing a decline over the 20-year period. They also fared worst with regard to national status, as two species (3.4%) had become nationally extinct between the censuses, whereas no birds and only 0.4% of plants had become nationally extinct over a 70-year period.

The authors suggested that butterflies may be acting as a more sensitive indicator of environmental change (e.g. habitat fragmentation and climate change) than other well-studied groups and may therefore provide a means of forecasting declines that may eventually affect a wide range of flora and fauna. Surveys of other invertebrates have been less intensive and therefore less informative, but the authors cite a number of studies which indicate that some groups such as Hymenoptera and Diptera may be declining in Britain at a rate similar to that of butterflies.

Worldwide, the relative extinction rates of invertebrates, vertebrates and plants are very hard to compare, due partly to lack of data and partly to the difficulty of making like-for-like comparisons. However, the authors tentatively suggest that the unrecorded extinction of the world's invertebrates may be occurring on a such a scale "... *that the biological world is approaching the sixth major extinction event...*"

### Reference

Thomas, J.A., Telfer, M.G., Roy, D.B., Preston, C.D., Greenwood, J.J.D., Asher, J., Fox, R., Clarke, R.T. & Lawton, J.H. (2004). Comparative losses of British butterflies, birds and plants and the global extinction crisis. *Science* **303**, 1879-1881.



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### NOTICE

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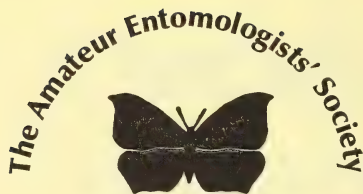


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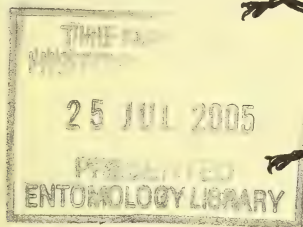
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# INVERTEBRATE CONSERVATION NEWS



**No. 47, June 2005**

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## EDITORIAL

One of the items in this issue of *ICN* concerns a 'landscape-scale conservation project' for the Marsh Fritillary butterfly *Euphydryas aurinia* in Wales. Another item concerns a landscape-scale project for riparian land in South Africa. Also mentioned is a new system of agricultural grants in the European Union, which should help to provide incentives for conserving farmland biodiversity. The development of projects in the 'wider countryside' follows several decades during which there has arguably been an over-reliance (at least in the UK) on the designation of individual sites, selected because they support species or communities deemed worthy of special protection.

Site designation has been seen as a basis for preserving the best examples of recognised biotypes or the last refugia of rare species amidst agricultural intensification and urban expansion. Once a site is designated (e.g. as a Site of Special Scientific Interest or a National Nature Reserve in the case of the UK), legal controls can be implemented so as to prevent or modify potentially detrimental alterations in management. Equally, if a conservation body purchases a site, it can take charge of management so as to fulfil biological objectives, even if these would not be considered commercially viable.

Although the designation or purchase of sites has often been the only practicable means of protecting or enhancing local biodiversity, this approach alone has limited value for the conservation of invertebrates. Many species are in danger of dying out locally unless individuals can readily move between adjacent sites, so as to replenish colonies following adverse events. Local extinctions are especially likely to occur amongst species that are on the edge of their climatic range, where they are confined to micro-sites that can become unfavourable during



extremes of weather. If sites are designated for such a species, there is often a need to manage the surrounding countryside appropriately or to designate a number of sites that are large enough or in sufficient proximity to sustain a viable 'metapopulation'.

Even for invertebrates that have more climatic leeway, changes in floristic composition or structure can spell eventual disaster at sites too isolated to be easily re-colonised if the population collapses due to chance events. Population collapse could perhaps be postponed indefinitely by closely controlled site management, but the cost may be high and serious harm may be done to other species that require different conditions. Also, even if a population can persist for many years, it may become genetically so isolated that it loses some of its ability to adapt to potential environmental change.

Perhaps the greatest danger of over-reliance on designation (both of sites and species) arises when the planning authorities are considering changes in land use, such as urban development. The authorities are required to consider biodiversity only if the site concerned has been formally designated or if it supports one or more legally protected species. Even if such a species is present, the authorities sometimes allow urban development in return for some concession of doubtful value, such as the translocation of individual animals to another site.

Another serious drawback of site designation is that the associated legal controls often tend to alienate landowners and managers. Many of them have a genuine concern for wildlife, even if they are reluctant to admit that they may have been economically compelled to adopt ecologically harmful practices. Equally, however, they may also resent the intrusion of the law into their freedom to manage their own land. Resentment of legal intrusion not only works against a spirit of partnership, but also makes it difficult for biological recorders to obtain permission to enter sites. It would therefore seem far preferable to secure the co-operation of landowners and managers through agri-environment schemes which provide them with an economic incentive and a sense of ownership, rather than of alienation.

Despite the above criticisms, there is likely to be a continuing need to designate sites as being worthy of legal protection. The need may be especially great in marine areas, where there are yet few protected sites and where modern fishing methods can cause serious damage to sessile invertebrates and their habitats. On the other hand, there is a need to develop policies which can achieve wildlife conservation within the everyday landscape of farms, woodlands and urban green space. At the



very least, it seems essential to end the false dichotomy whereby sites are deemed either to have some biodiversity value or virtually no value.



## NEWS, VIEWS AND GENERAL INFORMATION

### **Farmland biodiversity: a new system of grants**

Most readers are probably aware that reform of the European Union's Common Agricultural Policy (CAP) will in future lead to a decoupling of most agricultural subsidies from food production. Under the old version of CAP, only 10% of subsidies were available for agri-environment schemes and the like. The new policy is based on a "Single Payment Scheme", which provides an annual payment. This payment which, in the case of England, is based on a farm's land area, will remove a direct incentive for farmers to intensify production (e.g. via "headage" payments for livestock). They, might, however, still see a need to go down that route in order to earn profits in a competitive market. Another potential environmental advantage is that the payment will depend on the fulfilment of certain requirements for land management, including some limitations on spraying regimes.

Additional funds will be available for agri-environment schemes. In England, these will comprise a dual-level "Environmental Stewardship" scheme, which has been developed in consultation with NGOs so as to replace existing agri-environment schemes and is intended eventually to be taken up by two-thirds of farmers. "Entry Level Stewardship" will provide a flat rate of £30 per hectare in return for measures such as leaving unsprayed headlands, avoiding annual cutting of hedges and the creation of beetle banks. "Higher Level Stewardship" will provide funding for a range of more specific projects for restoring habitats and landscape features, and will be available on a competitive basis.

### **Back garden habitats: official recognition by a planning authority**

The London Wildlife Trust's *Wild London* magazine (Winter/Spring 2005), includes a special feature on wildlife habitats in urban gardens, which occupy one fifth of London's land area. The Trust is concerned about the increasing trend to re-develop back gardens so as to increase housing density. Although an increase in density can provide some





environmental benefits, such as shortening travel distances between homes, work and shops, it leaves little space for wildlife and reduces continuity between the remaining areas of green space. Unfortunately, it is the official policy of the UK government to regard back gardens as "previously developed" (brownfield) land, which should generally be preferred above greenfield land for new building.

Despite its concern about the continuing loss of urban green space, the London Wildlife Trust is pleased to note that a few of the London borough councils, for example Croydon, now recognise the value of back garden habitats in their development plans. This does not mean that such habitats are generally protected, but it does mean that these councils consider habitats in relation to each planning application. If a block of back gardens is environmentally important within the locality concerned, planning consent can be refused. The applicants may then appeal, but the council has a good chance of winning the appeal because it has a clear policy concerning habitats and landscape.

### **Butterfly Conservation Europe**

As announced in Butterfly Conservation's (BC) magazine *Butterfly* (Spring 2005), BC is collaborating with organisations in several European countries to form "Butterfly Conservation Europe". It is registered in the Netherlands, not as a membership organisation, but as a legal entity which will operate through partnership between organisations and individuals in each of the countries involved. The entity, of which BC Chief Executive Dr. Martin Warren is the first Chairman, will be eligible for European Union grants that are available for co-ordinating NGOs. Until funds have been obtained, a website: [www.europeanbutterflies.net](http://www.europeanbutterflies.net) will be the main focus of activity.

### **Advertisement: AES/English Nature Invertebrate Conservation Slide Packs**

Each of these educational packs contains 48 high quality slides, accompanied by a leaflet with commentary on each slide by Dr. Roger Key. **Pack 1**, comprising Grassland & Heathland and Wetland & Woodland is priced at £35 inclusive. **Pack 2**, comprising Upland & Farmland and Coastal & Greenfield Sites is priced at £37. Cheques, made payable to the "Amateur Entomologists' Society", should be sent to: AES Slide Packs, c/o Peter May, 6 Aigburth Avenue, Bognor Regis, West Sussex PO21 3DA.



## SITES AND SPECIES OF INTEREST

### Brighton Wainscot moth nearing extinction in UK?

There seems little hope for the survival of the Brighton Wainscot moth *Oria musculosa* in the UK, a Biodiversity Action Plan (BAP) priority species, according to a report by John Phillips, published in Butterfly Conservation's *Lepidoptera Conservation Bulletin* No. 6 (April 2004 - March 2005). In Britain, the moth has been associated mainly with cereal field margins, where its larvae feed on the crop. Indeed it is considered to be a cereal pest in some parts of its range, which extends across central and southern Europe and eastwards to Iran. Its decline in Britain is thought to be due to changes in farming practices, including the choice of crops, the time of sowing and the use of insecticides. It would therefore benefit from agri-environment schemes, if it is still present in the UK.

John Phillips reports that the moth has not been found by the Conservation Working Group of the British Entomological and Natural History Society, during surveys in the Salisbury Plain area of southern England from 2000 to 2004. The survey in 2004 was an extra one, following a programme that formed part of a UK Biodiversity Action Plan (BAP). Details of the BAP survey effort are being published in the *British Journal of Entomology and Natural History*.

### Dingy Mocha moth: habitat requirements in southern England

Another of the BAP priority moths mentioned in *Lepidoptera Conservation Bulletin* No. 6 is the Dingy Mocha *Cyclophora pendularia*. Butterfly Conservation conducted the largest survey of the moth since 2001 within the area of Dorset and western Hampshire, to which it is now thought to be restricted within the UK. Previous records indicate that it once occurred widely across southern Britain, from Devon and South Wales to Suffolk. Elsewhere it has been reported from most countries in Europe and eastwards to north and central Russia, southern Siberia, China, Mongolia, central Asia and Korea. It is very local and rare in Scandinavia.

The findings in Dorset confirm previous observations that the larvae occur mainly on small isolated bushes of willow *Salix* sp. in heathland. They were also found occasionally where the willows were growing in hedgerows or at the edges of scrub exposed to sunshine on at least two sides. Also, as in earlier surveys, a few larval colonies were found on willows in damp, scrubby grassland, rather than in heathland.



In the New Forest, Hampshire, only three larvae of *C. pendularia* were found, despite extensive searching. These occurred on willow bushes that were taller (up to 6 m) than those that were supporting the moth in Dorset, and there is a suggestion in the report that tall willows may fail to provide optimal conditions. Due to browsing by cattle and ponies, most of the willows observed in the New Forest were either more than 3 m high, or severely damaged.

These findings are probably significant not only for *C. pendularia* but also for many other invertebrates that occur in heathland and grassland. As has been well documented, excessive grazing can be very harmful to many invertebrates and their habitats and the same probably applies to excessive browsing of woody plants. Harm can also be done by well-intentioned attempts to restore heathland that has been colonised by trees and scrub. It is important to realise that many heathland habitats depend on woody species in addition to heather. Thus, heathland restoration should not involve the over-zealous destruction of scrub. Also, there is a need for a variety of micro-climatic conditions (ranging from full sun to shade).

### ***Malachius aeneus* (Scarlet Malachite beetle)**

Buglife – The Invertebrate Conservation Trust has launched a survey for this UK Biodiversity Action Plan Priority beetle, for which English Nature is the lead partner. The beetle is now one of Britain's rarest but it used to be widespread throughout much of England and had been recorded as far north as Northumberland. Internationally it is found throughout northern, central and southern Europe (including the Mediterranean region) into the Middle East and Iran. Interestingly, it also occurs in eastern North America. In 1931, the late Dr. Norman Joy described it merely as "local" in *A Practical Handbook of British Beetles*. By the 1970s, its British distribution seems to have become confined to sites ranging from north Somerset in the west to Essex and west Kent in the east. Now it seems to be found only at about nine small flower-rich sites in the south-eastern counties of Hampshire, Hertfordshire and Essex.

*Malachius aeneus* visits flowers in its adult stage and is then quite easily seen in sunny conditions, but only during a three-week period in May and June. Like other 'flower beetles' of the family Melyridae, it uses both pollen and prey items as an adult food source. The prey species are said to include the pollen beetle *Meligethes aeneus*. The larvae of flower beetles are generally predatory and this is thought to





be true of *M. aeneus*. Very little is, however, known about its life cycle. One case has been reported in which an individual was reared on a diet of prey items from larva to adult. The larva in question had been found under loose tree bark, and there is therefore some indication of a saproxylic association. A further clue is that woodlands or large hedgerows are adjacent to the flower-rich meadows where the adult beetles are found. Another feature of these sites is that the land use has not changed very much.

Under the Biodiversity Action Plan, it is intended to find out more about the beetle's habitat requirements, so as to identify the factors that have led to its decline in England and to develop a Species Recovery Plan. To the extent that it is possible to recognise some of the features of suitable sites, there is a plan to try to ensure that these features are maintained. Also, there is an intention to re-introduce beetles back to areas within its former range.

As the beetle is strikingly coloured, with a pattern of scarlet and metallic emerald green on its elytra, it is a good candidate for engaging interested naturalists in a 'hunt', so as to discover any previously unrecorded sites where it might occur. Accordingly, Buglife – The Invertebrate Conservation Trust has issued a leaflet, promoting a 'hunt' for the beetle, as part of the Essex biodiversity project. The leaflet includes photos by Dr. Roger Key, which show not only *M. aeneus*, but also some look-alike species that could be confused with it. Participants in the hunt are asked to report their observations (preferably e-mailing a digital photo if available) to Buglife.

The contents of the Buglife leaflet are available on: [www.buglife.uk](http://www.buglife.uk) and there is also an e-mail address: [scarlet.malachite@buglife.org.uk](mailto:scarlet.malachite@buglife.org.uk) for sending details of observations.

### **Landscape-scale conservation for the Marsh fritillary in Wales**

Writing in *Lepidoptera Conservation Bulletin* No. 6, published by Butterfly Conservation, Deborah Sazer has recently described the first Welsh landscape conservation project for an invertebrate species. As mentioned in *ICN* No. 44, Wales contains about 45% of the habitat sites for the Marsh Fritillary *Euphydryas aurinia* in the UK. For this reason, the Countryside Council for Wales (CCW) has paid special attention to this species in evaluating candidate Special Areas of Conservation (cSACs). The designation of sites as SACs and SSSIs allows them to be legally protected (with the pros and cons of a designation-based system), whereas the landscape-scale project is based on partnership



with landowners and offers the prospect of maintaining suitable habitat outside the formally designated areas.

The project covers an area of former common land, known as Mynydd Mawr, in the Cross Hands area of Carmarthenshire. As a result of 19th-century enclosures, the common became an area of small 'rhos' pastures, divided by hedgerows and ditches. Deborah Sazer explains that the owners of these pastures have not until recently felt the need for agricultural intensification, as they had been gaining most of their income via the mining industry. As a result, the area has remained a stronghold for *E. aurinia* but is now being affected by changes that have followed the decline of mining. In particular, some of the rhos pasture has been developed for housing, following the creation of a new business park at Cross Hands. Other threats to the habitat of *E. aurinia* include both over-grazing, especially by horses, and a lack of suitable grazing elsewhere. Also, the cutting of hay is harming the sward and the caterpillars.

The project will be based on management agreements with the support of funding from CCW. Other partners, besides Butterfly Conservation, include Carmarthenshire County Council and the members of the Local Biodiversity Action Partnership, which includes the South and West Wales Wildlife Trust. The funding will be provided to any owners who are willing to agree to a regime of light grazing of their rhos pasture, combined with the control of scrub. So as to assist the owners and to help boost the local economy, they will also be put in touch with people who can provide machinery or contract work. Also, links will be set up with volunteers. Additionally, members of the public will receive newsletters and invitations to events, so as to raise awareness of the importance of Mynydd Mawr and to seek volunteers for surveys.

### **Hay cutting as a threat to grasshoppers**

In a recent article in the *British Journal of Entomology and Natural History*, Tim Gardiner and Julian Hill report detailed behavioural observations on a population of the grasshopper *Chorthippus parallelus* at Writtle College in Essex, England. They found that both the males and females spent most of their time within 20 cm of the ground surface. Due to the high density of the sward at the study site, the zone near the ground was considerably cooler than the zone above 20 cm. Nevertheless, the grasshoppers remained mainly below 20 cm even when basking for warmth, which was their most frequent activity.



The authors suggest that, due to its preference for the lower part of the sward, this species is vulnerable to hay-cutting machinery, which typically operates within 5 to 10 cm of ground-level. Clearly, other grassland invertebrates have different requirements in relation to sward height, but the study emphasises the fact that mowing can be a direct cause of mortality. Although mowing is probably inimical to the success of *C. parallelus* at many sites, it remains a common species in the UK. There are, however, many vulnerable species, including the Marsh fritillary butterfly (see above), for which mechanised mowing is probably a major mortality factor.

### Reference

Gardiner, T. & Hill, J., (2005). Behavioural observations of *Chorthippus parallelus* (Orthoptera: Acrididae) adults in managed grassland *Br. J. Ent. Nat. Hist.* **18**, 1-8.

### Damage to marine habitats around the UK

According to a review published by the World Wildlife Fund, populations of several 'flagship' vertebrate and invertebrate species have declined over a five-year period due to fishing and other commercial activities in UK waters. The findings of the review have been criticised by representatives of the fishing industry, as being based on previously discredited government statistics. Whether or not this is the case as far as fish stocks are concerned remains a matter of debate, but it is clear that the habitats of marine invertebrates are being seriously damaged by activities such as trawling, dredging, insensitively placed fish farming and exploration for oil and gas.

Three of the ten species selected for the review were invertebrates: the Pink sea fan coral *Eunicella verrucosa*, the native British oyster *Ostrea edulis* and the Fan mussel *Atrina fragilis*. The review also covered the following marine biotopes: saltmarsh, seagrass beds, maerl beds, deep-water mud habitats, deep-water reefs and horse mussel beds dominated by the mollusc *Modiolus modiolus*.

The Pink sea fan coral is a sessile coelenterate whose motile larvae become established on rocky seabeds below the depth of turbid, alga-dominated water. Each individual consists of a much-branched column up to 8 mm in diameter and up to 500 mm high with a broad base. The branches increase in thickness by laying down annual growth rings, which may number up to 40. Individuals are often quite widely separated but they form dense 'forests' in some areas. The species is widely distributed in south-west Britain between north Pembrokeshire





and Portland (Dorset). Outside UK waters, it occurs on the west coast of Ireland and southwards into the Mediterranean.

Although *E. verrucosa* is not rare, its sessile habit and slow development make it very vulnerable to damage by various human activities, including dredging and the commercial collection of specimens as souvenirs. Also, it is important as a host species for another BAP priority species: the sea anemone *Ampbianthus dohrnii*. It is therefore protected under Schedule 5 of the Wildlife and Countryside Act 1981 against killing, injuring, taking possession and sale.

Although *E. verrucosa* can clearly be harmed by dredging and by entanglement in fishing nets and lines, it is difficult to determine whether human activities are significant causes of population decline, compared with natural factors. Factors such as disease, grazing by predators or climate change have been cited. In one case, disease was the probable cause of a mass mortality event a few years ago at Lundy Marine Nature Reserve in the Bristol Channel, where the coral is better protected than elsewhere. As the UK is at the northern end of its natural range, it might be favoured by global warming, but perhaps not if this brings an increased incidence of damaging storms. Also warming could affect other organisms that interact with *E. verrucosa*. For example, a warm-water barnacle *Solidobalanus fallax*, previously not known in British waters, has been colonising populations of the coral in some areas since 1994. Also the corals can be smothered by ephemeral seaweeds which proliferate under certain conditions.

Individuals of the fan mussel *Atrina fragilis* are usually solitary but may occur in groups. Their fragile shells can reach a length of 400 mm and they are thought to live for 12 years or longer. Within the British Isles, they have been recorded in south-west England, western Ireland and western and northern Scotland, but it is not known whether these populations are self-sustaining. It has been suggested that they arise from larvae carried in currents from waters further south, in the Bay of Biscay and along the Atlantic coasts of Spain and Portugal where the species is more abundant.

The WWF report states that the species, never abundant in the UK, is in severe decline and has become rarer. The main threat to its survival appears to be physical disturbance, especially involving displacement or smothering. The use of mobile fishing gear is thought to be especially damaging. *Atrina fragilis* has a slow rate of breeding, and so its populations cannot easily recover from mortality of individuals. Also, it has been collected in the past as a souvenir, but is currently protected in the UK under Schedule 5 of the Wildlife & Countryside Act 1981.



WWF is proposing that *A. fragilis* should be added to Annex IV of the Habitats Directive, to the Berne Convention and to CITES. International protection of its habitats in SW Europe could help to reduce the impact of dredging for other shellfish.

Dredging and trawling for shellfish (e.g. scallops and scampi) are being blamed also for serious damage to other important marine habitats, including Horse mussel beds, formed by *Modiolus modiolus*, maerl beds formed from calcified seaweed and deep-water mud habitats. Horse mussel beds, which occur within northern waters of the UK, provide habitats for about 100 other animal species. As mentioned in ICN No. 43, the Horse mussel beds in Strangford Lough, Northern Ireland were cited as one of the reasons why the Lough was designated as a Marine Nature Reserve and identified as a candidate Special Area of Conservation. WWF states, however, that surveys indicate that an area of 3.7 km<sup>2</sup> of these beds has been lost since 1993 due to trawling. This has now been prohibited in the Lough, but WWF is seeking controls on the use of heavy trawling gear in other areas where Horse mussel beds are important.

In view of the damage that is being done to marine biotopes, WWF is arguing that protective legislation in the UK is inadequate because it has been developed on a sector-by-sector basis, resulting in a piecemeal approach. WWF and other NGOs are therefore pressing for new marine legislation, which would provide for the designation of "Nationally Important Marine Sites" where activities potentially damaging to *A. fragilis* and other designated species and habitats would be prevented. Also, WWF is seeking ways of regulating fisheries and other industries, so as to lessen the use of damaging techniques such as trawling and dredging.

### Reference

WWF (2005). Marine Health Check 2005: A report to gauge the health of the UK's sea-life. 80 pp.

### Butterflies on brownfield sites

Despite the many efforts to raise awareness of the value of brownfield sites, politicians (aided by ignorant journalists) are still reciting the mantra that brownfield sites should always be selected for building in preference to greenfield sites. Perhaps part of the problem is that some of the wonderful wildlife on brownfield sites is regarded as being in the 'creepy crawly' category. Butterflies seem to be largely exempt from



such prejudice, but there are some species for which brownfield sites are very valuable. For example, the Durham Wildlife Trust's magazine (Spring/Summer 2005) mentions that sparsely vegetated brownfield sites are of especial importance for the Dingy Skipper *Erynnis tages* within that north-eastern county of England. These include railway embankments.

Further south in England, similar findings have emerged from a survey of the Dingy and Grizzled Skippers *E. tages* and *Pyrgus malvae* in the East Midlands. As reported in Butterfly Conservation's (BC) magazine *Butterfly* (Spring 2005), volunteers from BC's East Midlands Branch in 2003 and 2004, found that about half of the area's previously recorded colonies had apparently died out. Most of the current colonies were on brownfield sites, such as quarries and railways. Some colonies of *E. tages* were newly discovered on former coal workings.

BC will be contacting landowners and others with responsibility for the East Midlands sites, so as to give advice and encouragement for future management. This will be valuable, provided that the management takes proper account of all biotopes that are present or developing on these sites. However, much remains to be done to promote awareness of brownfield biodiversity.

The same issue of *Butterfly* includes an article on another brownfield site, Shipley Railway Station Meadow in Yorkshire, which is now protected under an agreement involving BC, Bradford Urban Wildlife Group and Leeds Groundwork Trust. In 1992, with the agreement of the erstwhile British Rail, the site, which lies between two railway platforms, was rescued from development as an extension to the station car park. Nine species of macro-lepidoptera have been recorded there.

### **Removal of alien trees helps Odonata in South Africa**

Writing in the Xerces Society's *Wings* magazine, Dr. Michael Samways of Stellenbosch University reports that the Odonata of the southern tip of South Africa have been badly affected by the shading of streams by invasive alien trees, including *Acacia* spp. The banks of the streams were previously occupied by native bushes, but these have often been obliterated by the alien species. The resulting dark, sterile conditions are unfavourable for Odonata, such as the Basking Malachite *Chlorolestes apricans*, which has become nearly extinct, according to Dr. Samways. Other damaging factors that he mentions include the over-extraction of water, the drainage of wetlands, trampling of stream banks by cattle and the introduction of exotic predators such as Rainbow trout *Oncorhynchus mykiss*.





Dr. Samways reports that some of the damage to riparian habitats is being reversed as a result of a national programme called "Working for Water", which began in 1995 as a joint effort among several government departments. The removal of alien plants from waterways is one of the activities undertaken under the programme. By removing shade and allowing the regeneration of native plants, this work has enabled the return of some species of Odonata that had not been seen for several decades. These include the Ceres Stream damselfly *Metacnemis angustata*, the Harlequin Sprite *Pseudragon newtoni* and the Cape Bluet *Proischnura polychromatica*.



## ERRATA (ICN 46)

### **We apologise for the following errors in ICN 46 (February 2005)**

**Fen raft spider: new discoveries in SW England and Wales:** The species of raft spider found at Devon Wildlife Trust's reserve at Venn Ottery was *Dolomedes fimbriatus* and not the rarer *D. plantarius* (Fen raft spider). The error was due to a misreading of a DWT report on the results of a survey at the reserve. We are grateful to Peter Harvey for querying the item; he has pointed out that, as Venn Ottery is a lowland heath, it would be very surprising to find *D. plantarius* there.

**Military developments and the Heath Fritillary, NE England:** This item referred to the Large Heath butterfly *Coenonympha tullia* and not to the Heath Fritillary, as incorrectly shown in the title. Thanks to Peter May for drawing attention to the error.

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### NOTICE

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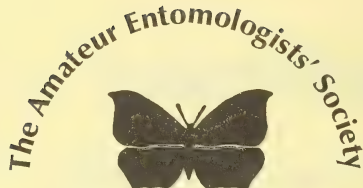


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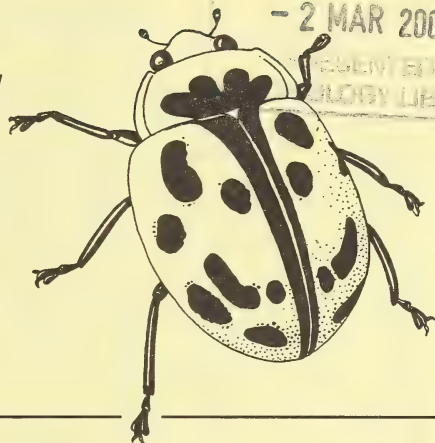
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# INVERTEBRATE CONSERVATION NEWS

No. 48, October 2005



## EDITORIAL

This issue of *ICN* includes a brief report from the insect conservation symposium held in September 2005 by the Royal Entomological Society. One of the main themes was education and public awareness and so the symposium should help pave the way for two further UK events that are planned for the UK; i.e. the next Invertebrate Link conference (date still to be decided) and National Insect Week in June. Some of the presentations at the symposium showed impressive examples of the techniques that can help educators to reach out both to children and adults. On the other hand, there was serious concern about the apparent decline in the number of youngsters showing a lasting interest in insects and other invertebrates.

Considering some of today's educational media, including attractive 'creepy-crawly' books for children and amazing photography of invertebrates on television, it may seem strange that there is cause for concern over the lack of future generation of entomologists. Exposure to education is, however, not the same as the development of a personal fascination with invertebrates. Such a fascination is perhaps potentially present in many youngsters but is often discouraged by adverse factors within the family or within society. As mentioned below in our report on the recent symposium, this problem was explored very effectively in the presentation by Roger Key.

Some of the adverse factors that Roger Key has identified cannot unfortunately be solved by naturalists or biologists alone. For example, we cannot change a popular culture which makes youngsters feel that it is 'uncool' to be interested in creepy-crawlies. Equally, we cannot change a risk-averse culture in which parents fear that their children will be abducted or otherwise abused if they go anywhere without being supervised by an officially accredited adult. What, then, can we do?



For those of us in the UK, the answer to the last question may become a little easier to answer after next year's conference and National Insect Week. For the present, it may be useful to mention a few ideas so as to encourage discussion. A special opportunity exists for anyone who has an interest in invertebrates and who also has school-age children. There are at least no legal obstacles to being alone with one's own children on a nature ramble, but there is also a need to remember one's own youthful fascination for finding invertebrates in the absence of adult supervision (i.e. 'doing your own thing'). If this can be allowed without undue fear, then it should be encouraged.

As members of invertebrate societies, perhaps we can find ways of fostering more interest among both children and adults. For example, we can distribute leaflets to places of education such as libraries and country parks. If we have more time to spare, then mounting a stand at a show can attract a lot of interest. Also, with the support of their members, organisations can try to engage more with people involved in education. For example, it may be possible to encourage teachers to run more invertebrate-based projects.

Another of the problems identified by Roger Key is the tendency for educators to tell children that it is wrong to take specimens of any living creature, including invertebrates. This is a very discouraging message, which detracts seriously from the natural development of a child's fascination for invertebrates. Also, it seems to foster a hypocritical attitude, whereby many grossly harmful activities (e.g. driving a car or hard-engineering your garden) are regarded as morally upright, whereas taking individual specimens is regarded as reprehensible.

There is a need to influence those who convey the negative message about the collection of specimens, but this obviously needs to be done tactfully and without trying to support excessive practices that would not be consistent with the "Code of Conduct for Collecting Insects and other Invertebrates", published by Invertebrate Link. Unfortunately, this kind of reasonable approach may be difficult to promote in certain countries in which a permit is required to collect virtually anything, unless of course the collecting device is the front of a car. But that's another story!





## NEWS, VIEWS AND GENERAL INFORMATION

### Ragwort control in Britain under the code of practice

Following the publication of the "*Code of Practice on how to prevent the spread of Ragwort*" in July 2004, there has been some time to assess how well the Code is working. Thanks to the influence of conservation bodies, including the AES and Buglife – The Invertebrate Conservation Trust, the final version of the Code makes it clear that any requirement to control ragwort should be based on an assessment of risk to livestock. Before publication, however, some landowning organisations such as certain local authorities were keen to adopt an anti-ragwort stance. Some of them appeared to be trying to eradicate it indiscriminately, especially on roadside verges.

As reported in *ICN 45*, Oxfordshire County Council was one of the first to respond positively to the need not to control ragwort except where risk assessment indicates that control is necessary. Unfortunately, a number of reports during 2005 have indicated that not all local authorities have followed Oxfordshire's lead and that many are under pressure from apparently uninformed 'anti-ragwort' individuals or organisations.

With these concerns in mind, Martin Harper has written to the relevant government department (Defra) on behalf of members of Wildlife and Countryside Link, including Buglife – The Invertebrate Conservation Trust. His letter, addressed to Judith Marsden, requests information on the steps that Defra has taken to inform local authorities of the Code, and to ensure that it is translated into policy at the local level. He is concerned not only about policy but also about the way in which it is translated into the actions of contractors who are employed to control ragwort.

Mr Harper refers to the appropriate stance that was adopted by Oxfordshire County Council following correspondence in August 2004 about a previous cause for concern. However, he cites examples of certain other local authorities which appear not to have adopted a balanced approach, based on risk assessment. For example, he quotes Adam Paynter, executive member for environment and heritage at Cornwall County Council, as saying... "We are doing all we can, but this year it just seems to be really bad – especially upcountry. The problem is that we can't do everything at once. There's so much of it around that it's really difficult". He also mentions that Devon County Council has been quoted as saying that ragwort was particularly prominent between June and August, when the authority deployed teams





specifically to deal with "such issues". Individual weeds were pulled out, while large areas were sprayed with herbicide.

Provided that local authorities adopt policies based on proper implementation of the Code, they will be well placed to respond to criticism from people who see ragwort in a totally negative light. Local newspapers in various parts of Britain have published letters from such people and there is therefore a need to redress the balance. This can be achieved not only by local authorities who adopt an appropriate and defensible policy but also by anyone who is prepared to write to newspapers so as to point out the need to take full account of the ecological value of ragwort and to use risk assessment before seeking to control it.

### **Woody nightshade: shades of the ragwort story?**

While some of us were campaigning to help avert an all-out war on ragwort in the UK, we were unaware that another native British plant (also with a specialist invertebrate fauna) was also being targeted under statutory control measures. Like ragwort, Woody nightshade *Solanum dulcamara* is poisonous to mammals, but this is not why it is being targeted. The reason is that Woody nightshade is an alternative host for a bacterium that causes a very serious disease of potatoes and tomatoes, known as brown rot (or bacterial wilt in the case of tomatoes). The bacterium, *Ralstonia solanacearum*, is believed to have been absent from the UK before the early 1990s but there have since been five confirmed outbreaks in potato crops – two in the Thames Valley (in 1992 and 1995), two in Northamptonshire in 1999, and one in Kent in 2000. Also, there have been two outbreaks of the disease in tomato crops grown at one locality in Bedfordshire (in 1997 and 1998).

As brown rot of potato is economically very damaging, there are legal provisions for the exclusion and/or control of the bacterium in countries where it does not occur or occurs only locally. The UK observes a European directive (Council Directive 98/57/EC) under which special control measures are placed upon growers of potatoes or tomatoes in areas that are designated as being contaminated with *R. solanacearum*. These measures apply specifically to watercourses, in which the bacterium is able to persist. If a watercourse is thus designated, there is a ban on its use for irrigating or spraying any crop plants which can act as hosts.

The persistence of *R. solanacearum* in watercourses is due to its ability to colonise the submerged roots of Woody nightshade. In view



of the significant impact that brown rot could have on UK potato production, the relevant government department (Defra; then MAFF), began the trial use of spot herbicide treatments (with precautions against spray drift) of Woody nightshade in 1998.

As reported on a Defra web-page, the herbicide trials have been taking place at designated watercourses in important potato producing areas, mainly in the eastern English counties of Cambridgeshire and Lincolnshire. The length of the riverbank and water margin recently being treated amounted to 330 miles (541 km) on the Rivers Great Ouse and Nene, the Stanground Lode/Crown Lakes and on the Fosdsyke Navigation/River Witham. Despite the discovery of the bacterium at additional sites in 2003, a decision was taken (in conjunction with stakeholders) not to extend the trials during the 2004 season. Such an extension could involve the eradication of Woody nightshade from stretches of the River Trent and its tributaries or associated canals in Staffordshire, Nottinghamshire and Lincolnshire. Other watercourses that might be considered for treatment occur in South Yorkshire and Cheshire.

In Scotland the bacterium has been found in the catchment of the River Tay in Perthshire. Eradication of Woody nightshade was undertaken initially along a stretch of the Lunan Burn, using the herbicide glyphosate. Then, in 2002, all plants of Woody nightshade growing with their roots in the water of the River Isla were eradicated. Relevant information on the website of the Scottish Executive extends up to February 2004, at which time there was a plan to eliminate Woody nightshade plants growing along the River Tay below its confluence with the River Isla. From an economic standpoint the disease is of especial concern to Scottish potato growers, as much of their income comes from the sale of certified 'seed' tubers.

Elsewhere in Europe, there are several countries in which the bacterium has been detected in plants of Woody nightshade. Eradication of plants from designated areas is being attempted in some of these countries, including Belgium and Sweden.

The eradication of Woody nightshade is evidently being restricted to areas where it is seen as a possible solution to a potentially serious economic problem. On the other hand, the eradication of a native plant and its associated fauna along hundreds of miles of water margins in England and Scotland is not a trivial matter and yet preliminary enquiries on behalf of *ICN* have failed to reveal any consultation with the relevant statutory bodies responsible for the conservation of biodiversity. It is hoped that a future issue of *ICN* may bring news of current of future consultation with these and other conservation bodies.



## More on the greenfield/brownfield debate

It will not have escaped the attention of our readers that London has won the bid for the 2012 Olympic Games. As discussed in *ICN* 46, there were concerns prior to the bid that the development of Olympic facilities would threaten the wealth of wildlife that has managed to survive in the predominantly urban area of the lower Lea Valley. The planners gave some lip service to the protection of wildlife, but this was couched largely in terms of landscaping and tree planting.

Now that London has proven successful in its bid, there is still an important need to hold the planners and politicians to their word, so that the inevitable reduction in the total area of habitat may be mitigated, perhaps by creating new habitats. Ken Livingstone, the Mayor of London, has been extremely supportive of both the Olympic bid and the urban development of the "Thames Gateway" (this is the name given to a large area to the east of London; see below under "Sites and Species of Interest, regarding a new invertebrate conservation project there") for much-needed new housing. It is hard to see how Mr. Livingstone's support for these developments rests easily with his well-known interest in wildlife, but he has reaffirmed this interest in an article in a recent issue of English Nature's urban conservation magazine "*Urbio*" (Summer 2005).

In his "*Urbio*" article, Ken Livingstone celebrates 20 years of a brownfield nature reserve (Camley Street Natural Park) behind Kings Cross railway station. He takes pride in his decision (then as leader of the Greater London Council) to veto plans for a lorry park on the site. This decision paved the way for the development of the reserve from its former condition as a derelict coal yard. In its new form, as Ken Livingstone proudly observes, the site has been visited and enjoyed by thousands of visitors every year, including schoolchildren.

The Camley Street reserve has been developed by active management so as to create very different habitats to those that existed when it was a derelict coal yard. It is therefore not very typical of the many other brownfield sites which in Mr. Livingstone's own words have great value, having been "reclaimed by Nature". He also mentions that such value can be destroyed by well-intentioned landscaping.

There could be great loss of brownfield habitats in the Lower Lea Valley and the Thames Gateway, and yet Mr. Livingstone does not mention how he intends to conserve these brownfield habitats at the same time as undertaking massive developments. He does, however, refer to his overall Biodiversity Strategy, under which he seeks "to



ensure that open spaces are preserved and protected appropriately so that all Londoners have access to quality natural places". He goes on to link the strategy with economic growth, but there seem to be some conflicts ahead, not least with the Olympic developments.

## SITES AND SPECIES OF INTEREST

### **"All of a buzz": a new invertebrate conservation project for London**

This project, launched by English Nature and Buglife – The Invertebrate Conservation Trust, aims to provide information on the rich invertebrate populations of the area to the east of London known as the Thames Gateway. The plan is to build 120,000 new houses there by the year 2016, many of them on brownfield land, which in many cases is more ecologically rich than so-called greenfield land. The project will collate the available survey information so as to help identify the key invertebrate assemblages and thus to recommend conservation strategies that are compatible with the planned developments.

### **Sustainability of trade in the entomogenous fungus *Cordyceps sinensis***

In a recent article in the *International Journal of Medicinal Mushrooms*, D. Winkler discusses issues relating to the collection of the fungus *Cordyceps sinensis* for use in traditional Tibetan and Chinese medicine. The fungus parasitises larvae of a range of ghost moth species in the genus *Thitarodes* (*Hepialus*) that occur in alpine grassland ecosystems of the Tibetan Plateau. Within the plateau, *C. sinensis* is restricted to areas that receive at least 350 mm average annual precipitation and lie within 250 m of the potential treeline (i.e. at an altitude ranging between 3300 m in the east to 5000 m in the west). Suitable habitat for *C. sinensis* is more extensive than formerly, owing to the continued conversion of forest to grassland by Tibetan graziers.

There is concern that the commercial collection of fungus-infected caterpillars might not be ecologically sustainable, but the author states that there is currently no evidence to support this view. The concern may stem partly from increased competition between collectors (who are already subject to a system of licensing and fees) and from intrusion by outsiders.

As far as the host moth species are concerned, the collection of dead caterpillars is unlikely to have any adverse effects, but there might be some reduction in the availability of fungal spores for the infection of future generations. Apart from concerns about commercial competition,





there appears to be no decline in the abundance of the fungus, despite the fact that specimens taken early in the season have reportedly not had time to produce spores. Another possible concern is that the activities of the collectors are disturbing the grassland ecosystem, albeit that much of the area was formerly forested.

The author accepts that, even if the trade in wild-collected material is currently sustainable, it might not remain so as demand for the fungus increases. He mentions that a possible solution is to produce *Cordyceps* under semi-artificial conditions, whereby caterpillars are bred and exposed to propagules of the fungus. This is already being done experimentally in some areas of Tibet. In any case, he supports the need to sustain the trade, for the benefit both of Tibetan communities and of people around the world who benefit from the medicinal use of the fungus.

### ***Malachius aeneus* (Scarlet Malachite beetle): news of survey in UK**

As mentioned in *ICN* No. 47, Buglife – The Invertebrate Conservation Trust has issued a leaflet, promoting a ‘hunt’ for this beetle, now rare in Britain, as part of the Essex biodiversity project. Buglife has recently reported that the beetle has been found in at least five new sites in East Anglia thanks to the response from the public. The contents of the Buglife leaflet are available on: [www.buglife.uk](http://www.buglife.uk) and there is also an e-mail address: [scarlet.malachite@buglife.org.uk](mailto:scarlet.malachite@buglife.org.uk) for sending details of observations.

### **Glow-worm colony earns reserve status for a roadside verge**

As mentioned in earlier issues of *ICN*, the distribution of the glow-worm *Lampyris noctiluca* within the UK is believed to have become more sparse than it used to be. This beetle seems to require a mosaic of tall and short grass and has therefore probably suffered from management regimes which destroy such a mosaic.

As the beetle has flightless females, it is probably ill-adapted to a landscape in which suitable habitats are too far apart to be colonised easily. It does, however, occasionally occur at sites where it was previously unrecorded, sometimes because it can be transported with farm products such as hay. In such cases, it tends to die out after one or two years if the habitat is not very suitable.

Although the beetle's apparent decline has not yet earned it any formal protection, it is good to see that the site of a recently discovered



colony in the English midland county of Worcestershire has been protected. According to a local press report in August 2005, the colony was discovered serendipitously on a roadside verge between Welland and Hanley Swan by two members of the Worcestershire Wildlife Consultancy, Ed Leszczynski and principal ecologist Alan Shepherd. Knowing that the beetle has been declining in Worcestershire as in other parts of the UK, Alan Shepherd contacted the local highway authority, the Malvern Hills Highways Partnership, to see if something could be done to protect the site. Mike Davis, the manager of the Partnership, responded positively, saying that the partnership recognised that roadside verges form an important wildlife corridor and was pleased to work with other organisations so as to manage those sites that contain plants or animals of particular interest. Accordingly, the site has been declared a Road Verge Nature Reserve.

The Worcestershire Wildlife Trust, which can supply a fact sheet about the habits and habitats of the glow-worm, would like to hear about any other sightings, with precise details of the location. Information should be telephoned to the Trust on 01905 754919.

### **Legal action against sheep dip polluters in Wales**

Past editions of *ICN* have carried a worrying number of stories about the mass killing of aquatic invertebrates by insecticides used in sheep dips. Currently a campaign to solve the problem is being run by Buglife – The Invertebrate Conservation Trust. In three recent cases in the Welsh county of Ceredigion, the farmers responsible were prosecuted by the Environment Agency Wales and fined in a magistrate's court after pleading guilty to polluting local streams with cypermethrin sheep dip.

In the first case, lambs had been treated with a licensed product containing cypermethrin three weeks before the direct effects were noticed along 0.7 km of a tributary of the Nant Creuddyn. Along a further 6 km of the lower reaches of main river, virtually all the invertebrate life had reportedly been wiped out. The shower was not equipped with a sealed drainage system and so there was a failure to comply with the code of good practice available on the "use and disposal of sheep dip chemicals".

The second case involved a stream called the Nant Egnant, which flows into the River Teifi via the River Mwyro. Invertebrate life in the Mwyro was found to be severely depleted and the River Teifi was also affected. In total five kilometres of river were affected. The evidence



suggested that the contamination had come from the fleeces of sheep that had been treated in a dipping bath and had then been exposed to heavy rain. The pesticide may have then flowed along a farm lane and then onto the road and eventually into the river.

In the third case, cypermethrin caused severe mortality of invertebrates in the Cefn Mawr and the Nant Y Cwn into which it flows and which is in turn a tributary of the River Teifi. The evidence suggested that pesticide from a sheep dip had entered a flow of water around the dip. The farmer had been using the flow of water to keep the feet of the sheep clean before they entered the dip; this enables the dip to work more efficiently. Unfortunately, the flow drained to the nearby stream.

Gareth Jones, of the Agency's local Environment Management team, emphasised the need for farmers and contractors to take great care to prevent the escape of any amount of sheep dip chemical before, during and after sheep treatment onto any areas which can drain into streams and rivers. He pointed out that even a few drops of a cypermethrin-based dip can severely affect aquatic life over kilometres of watercourses. There is therefore a need to ensure that the treatment site is suitable and that any water emanating from it is captured by a sealed drainage system. He pointed out that farmers and sheep dip contractors should follow the guidance available in the Defra Code of Practice: "*Use and disposal of Sheep Dip Compounds*", which is available from Defra or local Environment Agency offices.

### **Recovery programme for freshwater pearl mussel in Wales**

The freshwater pearl mussel *Margaritifera margaritifera*, which is listed on Schedule 5 of Britain's Wildlife and Countryside Act (1981) is covered by a Species Recovery Plan in Wales. The Countryside Council for Wales (CCW) has reported the start of a captive breeding programme, which forms part of the Plan. Adult mussels have been taken under licence from the Rivers Conwy, Dee, Ddu and Eden and are being kept by the Environment Agency (EA) in holding tanks as breeding stock. CCW reports also that the EA has begun to restore the Afon Ddu, an upland stream in Merioneth that probably held the best *M. margaritifera* population in Wales before it was dredged by local landowners ten years ago. The mussels that survived within the most damaged section have been translocated upstream and there has been an attempt to restore the natural state of the river bed by replacing boulders into a 150-metre stretch.



## Harlequin ladybird survey in the UK

Following the first sightings of the Harlequin ladybird *Harmonia axyridis* in south-east England last year, this Asian species has been seen at many more sites over a much wider area. As mentioned in *ICN* 45, there is concern that this voracious predator will harm populations of native ladybirds, both by preying on them and by competing for aphids as a food source. It is also known to prey on other species of invertebrate, including the eggs and caterpillars of butterflies. The widespread sightings in 2005 indicate that this invader has become well established in south-eastern Britain and so any thoughts of eradicating it are probably unrealistic. It remains to be seen whether it will be as damaging in Britain as it has proven in other countries outside its native range. There is therefore a need to monitor its spread and its effects on native ladybirds and so a project has been set up through the collaboration of Cambridge University, Anglia Polytechnic University and the Biological Records Centre (Centre for Ecology and Hydrology). Funding has been provided by the relevant government department (Defra) and the National Biodiversity Network.

Amateur observers' records will be welcome and can be submitted via the following websites: [www.harlequin-survey.org](http://www.harlequin-survey.org) and [www.ladybird-survey.org](http://www.ladybird-survey.org)



## PAST UK MEETINGS

### 'Ent 05', International Symposium on Insect Conservation Biology

About 180 individuals attended this meeting, which was held by the Royal Entomological Society at the University of Sussex, near Brighton, from 12th to 14th September 2005. We hope to review the written proceedings when they are published but we can in the meantime look at a selection of some of the themes and messages that emerged during the meeting.

Environmental change, especially climate change, was a major theme. Robert J. Wilson of the Universidad Rey Juan Carlos in Spain spoke about the effects of climate change on insects, especially butterflies,





that occur within mountainous areas. They tend to be restricted to certain altitudinal zones, and Dr. Wilson showed examples of species in Spain which have moved uphill over successive generations. If this continues, some of these species are eventually likely to run out of available habitat. In other cases, especially where species are currently limited to small, warm micro-habitats within areas are generally too cold for them, climate warming may lead to an increase in the available habitat. On the other hand, there are some species that may not benefit in this way, as they depend on other species (e.g. ants in the case of blue butterflies) which may respond differently to climate change.

The need to integrate conservation with everyday land management was addressed by some of the speakers. Prof. Tim New of La Trobe University, Melbourne, Australia, described a system of 'butterfly credits' which has recently become available to Australian farmers willing to undertake sympathetic management. Teja Tschamske of the University of Göttingen, Germany, looked at the structure of managed landscapes and concluded that complex landscapes (e.g. with a matrix of farmland and woodland) showed a higher frequency of natural control of agricultural pests (by parasitoids and predators) than simple landscapes (e.g. large arable areas).

Speaking about the use of species-listing in invertebrate conservation, Martin Warren of Butterfly Conservation said that there had been more success in targeting resources to conserve red-listed species than in designating sites for their habitat value. This led to some discussion, as there is cause for concern about devoting resources to a few favoured species. However, as David Sheppard of English Nature pointed out in another presentation, there is no true distinction between habitat-based and species-based conservation. There seemed to be some consensus that, provided that conservation could take place within the wider landscape, that it was possible to solve the problem whereby isolated reserves tend to lose species in the long term.

Education and public awareness was the theme of a number of presentations, including Mike Salisbury's exciting preview of "Life in the Undergrowth", David Attenborough's new TV series on invertebrates. Roger Key spoke quite movingly about his own experiences as a young entomologist and drew attention to various societal and other factors that nowadays seem to make entomology a much less attractive option for young people.

The above notes do not do justice to the many other very interesting presentations and discussions, but it will be easier to mention more of them when the full written proceedings become available.



## FUTURE UK MEETINGS

### **Ecology and Conservation Studies Society, lecture Series, Autumn 2005**

**"Non-native Species: Nasty Aliens or Benign Biodiversity?"**

Held in conjunction with Birkbeck College, University of London. Admission: £9 for each lecture at the door or £4.50 for pensioners, members of the Ecology and Conservation Studies Society (£7.50 p.a. membership fee) and students on related courses. For any queries, please contact tel: 020 7485 7903, or e-mail: [wright@britishlibrary.net](mailto:wright@britishlibrary.net).

This autumn's lectures will be somewhat controversial. A first class set of speakers will cover the subject from a broad introduction to a pointed conclusion. All the lectures will be held in Room B20, Birkbeck College, University of London, Malet Street, WC1E 7HX, from 6.30 to 8.30 pm on Fridays starting on 14th October. The lectures still to take place after *ICN 48* is due to appear are as follows:-

*4 November* – "Alien Mammals in Britain: their significance and ecological impact", Dr. Pat Morris, former Senior Lecturer, Royal Holloway, University of London, and Chairman of the Mammal Society. Consultant, author, broadcaster.

*11 November* – "Non-native Invertebrates" – Maxwell Barclay, Curator, Coleoptera, Department of Entomology, The Natural History Museum.

*18 November* – "They're over here, and there's more to come; an exotic future nature", Mathew Frith, Landscape Regeneration Manager, Peabody Trust. Formerly with English Nature, London Wildlife Trust, London Ecology Unit.

### **Buglife – The Invertebrate Conservation Trust: lecture**

Thursday, 3rd November 2005, University of Cambridge Zoology Museum, Downing Street, Cambridge, 6.30 - 9.00pm. Come along to hear Executive Producer Mike Salisbury explain the filming of 'Life in the Undergrowth'. . . David Attenborough's new series on invertebrates, and preview stunning clips. Contact Buglife to reserve tickets (tel. 01733 201210, website [www.buglife.org.uk](http://www.buglife.org.uk)). Prices - £6.00 non-Buglife members; £4.00 Buglife members & students.

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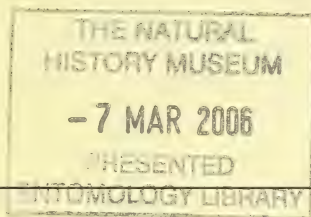
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# Invertebrate Conservation News



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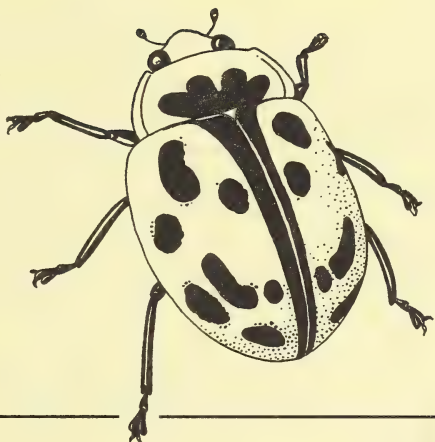
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# INVERTEBRATE CONSERVATION NEWS



No. 49, February 2006

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## EDITORIAL

Sir David Attenborough's recent BBC television series *Life in the Undergrowth* has allowed a large audience to see the subtlety of invertebrate behaviour in natural surroundings. In this way, people can begin to feel an empathetic connection with animals that have traditionally been regarded as pests or creepy-crawlies. This new perspective creates opportunities to promote invertebrate conservation and it comes at a time when public awareness of the cause has already been growing, at least in the UK, over the last few years. This includes some excellent coverage in wildlife magazines and of course the work of Buglife – The Invertebrate Conservation Trust.

In the eyes of the young or uninitiated, invertebrate conservation may appear to be a new movement. It has, however, developed over many years. Its British origins could probably be traced back as far as any other aspect of nature conservation, although perhaps with a strong bias towards Lepidoptera. By the end of the 19th Century, the Royal Entomological Society of London had already set up some form of conservation committee. After the Second World War, the erstwhile Nature Conservancy set up an Entomological Liaison Committee, on which the AES was represented by Graham Howarth. The Liaison Committee was superseded in 1967/68 by the Joint Committee for the Conservation of British Insects (JCCBI), now Invertebrate Link. Meanwhile, Butterfly Conservation (then BBKS) had been formed, and a conservation group had been set up within the AES. A few years later, the Xerces Society was formed in the USA.

One of the most important developments, which has been occurring for at least forty years, is a growing awareness of the importance of invertebrates other than Lepidoptera. Equally, it has become



increasingly accepted that their populations cannot be conserved merely by fencing off sites and calling them nature reserves. For most of that time, however, invertebrate conservation has retained something of its Cinderella status and it is only in recent years that it has begun to break through the barrier of public awareness. There is cause for concern if people mistakenly believe that invertebrate conservation needs to catch up with its counterparts not only in funding but also in the development of ideas and principles.

By any reasonable assessment, invertebrate conservation has been well ahead of the field in the development of ideas and principles. These include the recognition of the need for conservation in the wider countryside, a need which is fairly obvious in the case of invertebrate species which are at risk of extinction if they cannot disperse between localised areas of habitat. The wider countryside was a theme of the first issue of the bulletin that eventually became *ICN* (AES Conservation Group Bulletin No. 1, May 1969). The value of brownfield sites was also recognised long before they were even called brownfield sites (for example, see AES Conservation Group Bulletin Nos. 7, Dec 1972 and 17, Apr. 1978, as well as many recent issues of *ICN*).

Although much of the pioneering thought and debate took place out of the limelight, some of it has been expressed on the printed page. Invertebrate Link has published some important codes of conduct and guidelines on subjects including the collection of invertebrates, insect re-establishment and invertebrate site surveys. In 1991, the AES published the world's first comprehensive book on insect conservation. Also, the society has of course been publishing *ICN* and its forerunners since the late 1960s.

As ideas do not cost money, it is perhaps not surprising that invertebrate conservation is wealthier intellectually than financially. Perhaps through starvation in a metaphorical garret, rational and creative thought can flourish more than could be achieved in the lap of luxury. In this context, luxury is represented by the support that members of the public have long lavished on the conservation of other taxa, especially birds. Such support is clearly a 'good thing', not least because it allows activities such as the purchase and management of land as nature reserves. On the other hand, the luxury of such support may fail to concentrate the mind on key issues, such as conservation in the wider countryside. Encouragingly, however, such issues are now being increasingly addressed by organisations not primarily concerned with invertebrates.



It is excellent if ideas and causes that were pioneered within invertebrate conservation are being adopted by professional conservationists in other taxonomic areas. This seems, however, to be happening more on some fronts than on others. For example, it would be nice if all the conservation organisations could give strong support for brownfield conservation. Also, there are still signs that not all of them have given proper thought to the principles underlying wildlife law, including the issue of collecting specimens.

Entomologists and others have debated the collecting issue over several decades and still express a range of views. There is, however, wide agreement that legal protection of species should apply only to activities that are demonstrably putting their populations at risk. It therefore seems almost incredible that the anti-collecting laws of certain countries go beyond any such requirement to a ludicrous extent. In the UK an un-named organisation suggested only a few years ago in a 'focus group' consultation that invertebrates should be reverse-listed for protection; this would mean that collecting anything would be a criminal offence unless the law said otherwise. On a less extreme level, individuals within non-invertebrate organisations sometimes voice the opinion that anti-collecting law for invertebrates in the UK is too weak. They seem to be lagging behind their invertebrate counterparts in their thinking, perhaps confident in the assumption that no-one would ever dare to question the criteria by which they have won protection for their favourite taxa.

As far as public perceptions are concerned, some members of the public not only regard invertebrates as pests or creepy-crawlies but also incongruously see something abhorrent in the activities of those who take specimens from the wild. They clearly need to be won over by education. A continuing growth in public awareness is essential for invertebrate conservation, but it must not be won at the expense of pandering to ignorance and prejudice.







## NEWS, VIEWS AND GENERAL INFORMATION

### **Good brownfield sites: features to look for**

Many of our readers are likely to be living near brownfield sites that support very valuable invertebrate habitats and that might be under threat from re-development. In case you can gain access to a site that seems interesting, the following list of good habitat features should help you to decide whether you ought to enlist support for its protection. The list, adapted from an article in the Summer 2005 Edition of "*Urbio*", English Nature's urban biodiversity magazine, first appeared in an English Nature report by Peter Shepherd and Colin Plant: No. 650 (2005) *Exotic plant species on brownfield land: their value to invertebrates of nature conservation importance*.

1. Plant diversity (for a good range of foodplant habitats)
2. Bare ground (favouring warm micro-climates and allowing burrowing)
3. Soil of a type and structure that allows burrowing but does not collapse.
4. Places to shelter (including cracks in substrate, stones, leaf litter, dead stems and old buildings).
5. Varied topography (from quarrying, dumping or disturbance – for a wide variety of habitats).
6. Disturbance (providing bare ground, growth of ruderal plants as pollen and nectar sources and delaying succession towards total scrub cover).
7. Delayed vegetational succession (often due to harsh conditions or continued disturbance).
8. Surrounding land-use that provides additional habitats which complement those on the site itself.
9. Other important features (e.g. the size of the site, the length of time that it has been undeveloped and its previous use; also, the presence of features such as damp or wet areas).

### **Citrus Longhorn beetle: a new pest in Britain?**

In *ICN* No. 28, we included an article about the "Asian Longhorn beetle" *Anoplophora glabripennis*, specimens of which have occasionally been found in the UK, having escaped from wooden packing materials, used in the importation of goods from east Asia. The



fear is that this native of north-east Asia could, as in parts of the USA, become established and threaten the survival of valuable trees (perhaps including ancient trees and their priceless saproxylic communities) by larval burrowing. The loss of trees can occur either due to direct killing by the beetle or by a need to fell them so as to control the beetle.

Last September, there were a number of British sightings of a related species known as the "Citrus longhorn beetle" *A. chinensis*. As its Latin name implies, it is likewise a native of China. As with *A. glabripennis*, the adult lays eggs into the bark of a tree and the larva develops inside the tree, taking one to three years to emerge as an adult. The sightings, one of which was of a beetle emerging from a Bonsai maple (*Acer* sp), were not the first in Britain but they were as far apart as Lancashire in NW England and the south of England. The southern sightings were from imported Chinese maples.

The UK government department concerned (Defra), is asking people to look out for this beetle, as it is listed in legislation as a serious plant pest for which control measures are required. The beetle has been found damaging trees elsewhere in Europe, for example in the Netherlands, and it seems to have become established in the Lombardia region of Italy, where a major outbreak has been found. Its chances of becoming permanently established in the UK are, however, probably lower than in the case of *A. glabripennis*, as it is favoured by a warmer climate.

Like the related *A. glabripennis*, the beetle is large (21-37mm) and black, with distinct white markings and long antennae. The antennae are longer than the body and are black with white bands. It could be found on a wide range of trees or shrubs. Images of the beetle can be found on the Plant Health section of the Defra website, [www.defra.gov.uk/planth/phindx.htm](http://www.defra.gov.uk/planth/phindx.htm) or at: [www.eppo.org/QUARANTINE/insects/Anoplophora\\_malasiaca/ANOLMA\\_images.htm](http://www.eppo.org/QUARANTINE/insects/Anoplophora_malasiaca/ANOLMA_images.htm).

Defra is asking anybody who finds one of these beetles in Britain to contact the local Plant Health and Seeds Inspector or Forestry Commission office, details of which can be found on the websites of Defra ([www.defra.gov.uk/planth/senior.htm](http://www.defra.gov.uk/planth/senior.htm)) and the Forestry Commission.





## SITES AND SPECIES OF INTEREST

### **Marsh Fritillary: mixed fortunes in parts of England and Wales**

A survey of known Marsh Fritillary *Euphydryas aurinia* sites in Cumbria, NW England, in the summer of 2004 revealed a status of near extinction, according to a report in the 2004-05 *Lepidoptera Conservation Bulletin*, published by Butterfly Conservation (BC). No sign of the butterfly was found at Keswick, where it had been previously found at one site only, nor at a site near Penrith. The butterfly was still present at another Penrith site but, in the absence of a sympathetic grazing regime, the habitat had deteriorated to the point where only two small larval webs could be found. Grazing by Highland cattle had meanwhile been implemented but it was decided (after much consultation) to remove the larval webs for captive breeding. As the species is fully protected under the Wildlife and Countryside Act 1981, this had to be done under licence from English Nature. Also, the breeding is being undertaken by a member of English Nature, Dr Keith Porter, who has the necessary experience. The plan is to re-introduce the species to the site in a few years, when the habitat quality has improved sufficiently.

According to the UK Ministry of Defence (MoD) conservation magazine *Sanctuary* (No. 35 – 2005), a slightly happier situation obtains in Wiltshire. The population of the butterfly in the MoD's Porton Down estate is low, but a BC survey in 2003 showed that the larvae were feeding on Small scabious *Scabiosa columbaria*, rather than the more usual foodplant, Devil's-bit scabious *Succisa pratensis*. As a result of this finding, the site concerned is now being managed so as to control scrub. The work is being done with assistance from a European Commission LIFE-Nature Fund.

A much happier picture has emerged from another survey on Ministry of Defence land, this time in the Castlemartin Ranges of Pembrokeshire, SW Wales. This area is now famous for its thriving populations of various rare invertebrates, including some rare true bugs, as mentioned elsewhere in this issue of *ICN*. Strangely enough, the butterfly was recorded there for the first time as recently as June 2003. The survey, conducted in September of that year and in April 2004, showed the population to be large, although it appears from the lack of previous sightings either to be of recent origin or to have been inconspicuously small and to have suddenly soared. The surveyors were particularly encouraged to find even more evidence of the butterfly in April 2004 than in September 2003. They had been



concerned about possible overgrazing due to the seasonal introduction of 12,000 hill sheep during the winter. A programme of annual monitoring is now in place.

### **Small Pearl-bordered fritillary at Pamber Forest, southern England**

The Small Pearl-bordered fritillary butterfly *Boloria selene* was once common in woodland throughout much of England but its populations have declined so much that there are now only a few colonies left in the well-wooded county of Hampshire in southern England. The Hampshire and Isle of Wight Wildlife Trust (HWT) has been working for thirteen years to improve the habitat of the butterfly at the Pamber Forest reserve and has recently reported progress in its magazine.

The decline in coppicing as a widespread method of managing woodlands is generally blamed for the decline of a range of sun-loving invertebrates, including *B. selene*, which requires not only the warm conditions of short vegetation but also a supply of violets, which are its larval foodplant. The right combination of conditions occurs between two and five years after coppicing. Thus, in 1992 HWT began to establish a coppice cycle at Pamber, so as to help the one remaining colony of *B. selene*. The colony was surviving in a permanent clearing, in which there had already been intensive management of the butterfly's habitat, and so it was decided not only to begin coppicing nearby but also to fell mature trees along woodland rides and around the coppice sites, so as to improve conditions for the dispersal of the butterfly.

The report mentions that the early stages of the work produced little reward, but that a considerable increase in sightings occurred in 2005. This information consist of an index value, which is based on a timed count within a specific area. The method was first used in 1998 and showed an average annual index value of 38 until 2004. In 2005, the value increased to 65 and, perhaps more significantly, there were new sightings all over the reserve and at adjacent sites such as Silchester Hill and nearby gardens.

The fact that the early work did not have much effect on the butterfly is of interest, from both an ecological and a practical point of view. Also, it is always important to think carefully about any form of management, as there is inevitably some loss of habitat for species other than the species of special interest. In the case of coppicing, there are of course many invertebrates other than fritillaries which benefit.





On the other hand, it is important to try to avoid destroying deadwood habitats and sap-runs which occur on old coppice stools and are vital for various invertebrates.

### **Decline of British moths: data from the Rothamsted Survey**

The Rothamsted Survey of macro-moths provides one of the world's longest-running and most geographically extensive insect data sets. The survey, which is based on a network of 80 to 100 of tungsten light traps, has been running since 1965 and so provides a means of monitoring populations over a long enough period to iron out the effects of annual fluctuations. In 2002, Butterfly Conservation obtained funding from the Esmée Fairbairn Foundation for a joint project of data analysis with Rothamsted Research. The results of the analysis, which were released in 2004, showed alarmingly that the annual catch of individuals of 338 common moth species declined by a third between 1968 and 2004 (Conrad *et al.* 2004). This overall decline was attributable to 226 species, with the five greatest declines occurring in the Dusky thorn *Ennomos fuscantaria*, Hedge Rustic *Tholera cespites*, V-moth *Semiothisa wauaria*, Double Dart *Graphiphora augur* and Garden Dart *Euxoa nigricans*.

Of the species that did not decline in abundance, 69 showed a substantial increase; at least double in the case of 46 species. The five greatest increases were shown by the Least Carpet *Idaea rusticata*, Blair's Shoulder-knot *Lithophane leautieri*, Satin Beauty *Deileptenia ribeata*, Treble Brown Spot *I. trigeminata* and Scarce Footman *Eilema complana*.

A geographic breakdown of the data showed that the decline in abundance was greater in the south of Britain than in the north, with the south-east showing the greatest decline. One of the sites in southern England is at Alice Holt Forest on the Hampshire / Surrey borders and is one of seven within the UK Environmental Change Network. Staff of Alice Holt Research Station analysed trends at this site during the period 1966 to 2001 (Benham and Pitts, 2004), selecting those which occurred in sufficient numbers for statistical analysis. Of these species, 40 were selected as being dependent on broadleaved trees, which provide a major local habitat, and 36 as being dependent on herbaceous plants. It was found for both groups that 82% of the species declined in abundance and that only 15% increased. Also, the total number of species declined, with the highest number (272) being at the start of the period (1966) and the lowest (178) in 1993 and 1998.



Since land use around the Alice Holt trap has not changed very greatly over the 35-year survey period, the decline cannot easily be attributed to the factors that are generally blamed for the destruction and fragmentation of habitats and that may well help to explain the results of the nationwide analysis. An analysis of temperature and rainfall at Alice Holt showed trends which have been associated with the decline of temperate northern moths (e.g. warmer and wetter winters). The authors of this local study suggest that the effects of weather and climate are not only direct (e.g. affecting winter survival), but also indirect (e.g. affecting the relative timing of vegetation growth and moth life cycles).

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### A UK BAP moth in the wild at London Zoo

According to a report in the 2004-05 *Lepidoptera Conservation Bulletin*, published by Butterfly Conservation (BC), a field meeting in the grounds of London Zoo during 2004 provided the first survey of invertebrates other than butterflies at the site. Among the species discovered was a Biodiversity Action Plan (BAP) moth, the Buttoned Snout *Hyphenia rostralis*, which feeds on hop *Humulus lupulus*. The report also mentions that this moth is being studied at Writtle College in Essex, under a joint project between the college and the local branch of BC. The study, which involves observing a colony of the moth enclosed within an observation cage, has so far not revealed the mating or adult feeding behaviour of the species, although there has been evidence of breeding in the form of larvae and pupae.

### Invertebrates of dynamic sand dunes in SW Wales

The UK Ministry of Defence (MoD) conservation magazine *Sanctuary* (No. 35 - 2005) includes an article on invertebrates of the sand dunes at the Castlemartin Peninsula, Pembrokeshire, SW Wales. The dune system includes fixed and semi-fixed plant communities and is bordered on the seaward side by a narrow band of mobile dunes, with small patches of embryo dune.

The author of the article, Dr Steve Judd of the National Museums, Liverpool, was asked to undertake a survey on behalf of the



Countryside Council for Wales. The main interest was in two rare bugs, whose UK populations (unlike those in some other parts of Europe) are known only from coastal sand dunes. The shield bug *Odontoscelis fuliginosa*, 6 to 8 mm in length, (Red Data Book Category 3) is associated with Stork's bill *Erodium* spp. and other plants on open, fairly stable dunes. It is a ground-dwelling species and requires sparsely vegetated areas, where it can burrow into sand or under stones or moss. The seed bug *Pionosomus varius* (Red Data Book Category 3) is a much smaller animal (2 to 3 mm long). Its exact habitat requirements are uncertain but it is associated with Little Mouse Ear *Cerastium semidecandrum*, Biting Stonecrop *Sedum acre*, Common Storks-bill *Erodium cicutarium* and Shepherd's Purse *Capsella bursa-pastoris*.

Steve Judd and his colleague Chris Felton searched seventeen locations at the Castlemartin MoD Range and a further forty in adjacent or nearby areas at Broomhill and Kilpaison Burrows (a Site of Special Scientific Interest), Stackpole National Nature Reserve and Freshwater East. Using direct searching and a variety of soil sampling methods in September 2003 and 2004, they newly discovered *O. fuliginosa* at the Castlemartin Range; at ten separate sampling locations. Most of these were small rabbit scrapes, edged with Common Storks-bill *Erodium cicutarium*, but the bug also occurred on a quarry floor and a high fixed dune. It was also found at a further eleven locations elsewhere on the Castlemartin Peninsula.

Fewer sightings were made of *P. varius*, which was found at three locations within the Peninsula and at a further ten locations elsewhere, including a newly discovered one at Freshwater East. The three locations on the Peninsula were all south-facing 45° slopes, with small areas of disturbed sand and rabbit scrapes, with very short rabbit-grazed turf with moss and thyme *Thymus drucei*. Other invertebrates, 158 species in all, were also recorded from the bare sand habitat, including twelve Nationally Scarce species, of which two were found at the Castlemartin Range; a ground beetle *Harpalus servus* and a weevil *Sitona waterhousei*.

There is concern that dynamic parts of the dune system are giving way to vegetational succession, due to changes in grazing regimes and in rabbit populations. The above rare bugs and many other invertebrates depend on the bare sandy habitats provided by the dynamic dunes. Dr Judd was encouraged to find that both the bugs were widely distributed across the dune complex but he concluded that their long-term survival depends on the provision of a more dynamic system, with larger areas of bare sand and short, herb-rich rabbit-grazed grassland.



## Gwent Wildlife Trust: insect survey

The Gwent Trust in SE Wales has announced highlights of the results of a survey that was commissioned from Dr Peter Kirby. The survey, which took two years, covered thirteen of the Trust's nature reserves and recorded nearly a thousand species, including 120 of UK-wide conservation significance – either Nationally Notable (NB) or listed in the Red Data Book (RDB).

Peter Kirby has provided management recommendations for all the rare species, which include the RDB category 1 (endangered) crane fly, *Ellipteroides alboscuteatus*, at Prisk Wood, near Monmouth; a species which is otherwise known only from a couple of sites in the neighbouring English county of Herefordshire. Its larvae develop in damp conditions associated with calcareous flushes. Another species found at Prisk Wood is the NB leafhopper *Pediopsis tiliæ*, which is associated with old lime trees on the site. The site produced records of some rare saproxylic species, including the flies *Oedalea tibialis* and *Keroplatus testaceus*.



## PUBLICATION REVIEWS

### Ants of Surrey

by John Pontin, published by Surrey Wildlife Trust October 2005, 88 pp., 16 colour plates. Hard cover, £14.00 (plus £2.40 postage & packing). ISBN 0-9526065-9-3. Available from Atlas Sales, Surrey Wildlife Trust, School Lane, Pirbright, Woking, Surrey, GU24 0JN, Tel: 01483 488055; website [www.surreywildlifetrust.co.uk](http://www.surreywildlifetrust.co.uk)

A full review of this, the latest addition to the acclaimed Surrey Wildlife Atlas series, is appearing in the main AES *Bulletin* and so this note in *ICN* will focus mainly on the relevance of the book to conservation. Like other books in the series, it includes an account of each species, with a county distribution map, showing the 2 × 2 km tetrads in which the species has been recorded. There are also headed statements about the status of the species in Surrey and the following text provides very useful information about the habitat of the species, together with a note about its British distribution.





Conservation figures prominently in the book. The development of new roads and houses, as mentioned by Cedric Collingwood in the Foreword, is a major cause of habitat loss, but extinctions are occurring also within ostensibly protected areas. For example, the author describes the extinction of the Nationally Notable species *Myrmica schencki* at Chobham Common due to trampling by cattle, which were intended to be a tool of conservation. On a more positive note, he describes species recovery work for *Formica rufibarbis*, whose known UK population is confined to four nests in Surrey. He highlights the importance of pioneer heathland for various ant species and argues in favour of burning, which has helped to maintain this habitat on the Surrey rifle ranges. He warns, however, that fire can wipe out colonies of shallow-nested species such as *Tapinoma erraticum*. In his view, another valuable feature of the rifle ranges is that they are protected from public access, which he considers to have been a major factor in extinctions of species at sites close to large human populations.

### **Managing Woody Debris in Rivers and Streams**

Published by Water for Wildlife (a partnership in England of The Wildlife Trusts, the Environment Agency and Severn Trent Water). 2005, 15 pp., 31 colour plates. A5 soft cover, free. Available as downloadable PDF and Powerpoint versions from [www.staffs-wildlife.org.uk](http://www.staffs-wildlife.org.uk)

For far too long, woody debris in rivers streams has been widely regarded as little other than a nuisance and a form of rubbish. As many naturalists and freshwater biologists know, however, it has considerable habitat value for invertebrates and is uniquely important for certain species. The publication of this new booklet, with funding from Biffaward, is a very welcome development in emphasising the value of woody debris. The booklet is intended to promote "best practice to farmers, riparian landowners, site managers, drainage boards, anglers, foresters, local authorities, water policy makers, teachers, students and the general public".

The booklet defines woody debris as consisting either of tree stems and large limbs (Large Woody Debris LWD) or of small material (Coarse Woody Debris or CWD). In woodland ecology, CWD is often taken to include stems and large branches, but these definitions are only a matter of convenience in a particular context. The booklet's key message about LWD is that its undesirable effects on water flow and erosion have been misunderstood or exaggerated, while its ecological value has often been overlooked or downplayed.



A series of colour plates and accompanying text explains the ways in which LWD is important; as a stabiliser of river banks and beds, as habitat for fish, as a diversifier of sediment-based and erosion-based habitats and as a direct provider of habitat niches for aquatic plants and invertebrates. Its value for carbon storage is also mentioned. The value of emergent LWD for both invertebrates and birds requiring cover and perches is emphasised and one of the colour plates shows an adult Club-tailed dragonfly *Gomphus vulgatissimus*, emerging on some LWD. On the subject of invertebrate species which depend on LWD or CWD, the booklet refers to research on 147 species strongly associated with these habitats. These include the UK Biodiversity Action Plan (BAP) cranefly *Lipsothrix nigristigma* (= *nobilis*), the Nationally Scarce hoverfly *Chalcosyrphus eunotus* and the rare Lowland Riffle beetle *Macronychus quadrituberculatus*, all of which have a larval stage developing in CWD. These species and others are included in the colour plates.

The nature of the 'challenge' is explained in the context that over 85% of lowland rivers in England have been deepened, straightened or otherwise modified so as to provide defence for settlements and farmland on the floodplain. The booklet is forthright in condemning the results of some of this work, illustrating for example a section of the River Sow and describing it as more akin to a large drain than a river. The booklet is equally critical of attitudes towards woody debris and suggests that a great deal of taxpayers' money has been mis-spent on clearing blockages. Not only is woody debris being unnecessarily and harmfully removed; there is also a growing shortage of woody material in areas where overgrazing by livestock is preventing the regeneration of riparian trees. Excessive coppicing is said also to be reducing the future supply of woody debris.

The booklet gives some very helpful guidelines not only on the retention of woody debris (e.g. pegging it in place) but also on the identification of situations (e.g. where bridges or culverts could be blocked) where there is good reason for selective removal. Finally, there are several illustrated case studies, which help to illustrate objectives, costs and achievements, followed by a useful list for further sources of reading and information.

This excellent booklet deserves to be read and used by everyone involved in the management of streams and rivers.

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# Invertebrate Conservation News



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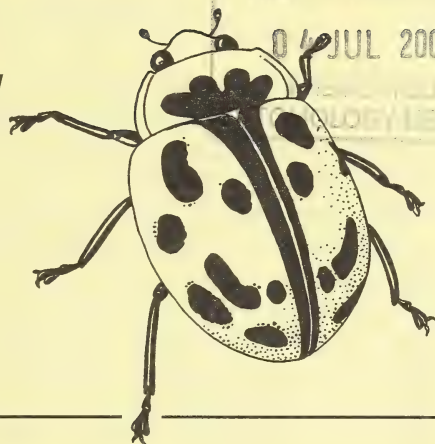
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# INVERTEBRATE CONSERVATION NEWS

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## EDITORIAL

News of brownfield habitats being destroyed by site development (or being saved from it) tends to evoke visions of former industrial sites or of 'slum' clearance zones in inner cities. The definition of brownfield land can, however, be wider. Under current UK government guidance it even includes residential gardens, where new homes are increasingly being built behind the existing houses. As mentioned elsewhere in this edition of *ICN*, some members of the UK Parliament have challenged this guidance. They have drawn attention to statistics which indicate that, in 2004, 15 per cent of all new family homes were built in the back gardens of existing dwellings, rather than on derelict land. This figure compares with 11% in 1997.

The political campaigners are accusing the UK government of allowing high-density homes to be built on "beautiful, green and environmentally important gardens". From a conservation standpoint, this is a welcome move but it is far from being a major political breakthrough. The campaigners seem to be happy with the underlying government guidance that the development of brownfield land in general should be permitted. Perhaps they are unaware that derelict ex-industrial land is usually far richer in biodiversity than most of the farmed countryside.

Any loss of green space within built-up areas is in principle harmful because it reduces the area available not only to wildlife, but also to natural processes such as carbon fixation and the percolation of rainfall into aquifers. As far as invertebrates are concerned, the consensus seems to be that back gardens are less valuable than extensive areas of industrial dereliction. Gardens probably include more barriers to the dispersal of the less mobile species and they are often too tidy for



many forms of wildlife, apart from a population of birds kept artificially high by a supply of food bought in from elsewhere. On the other hand, each garden is under a different management regime, thus contributing to a mosaic of micro-habitats.

As mentioned in *ICN* 46, (February 2005), a survey in South Yorkshire showed evidence of considerable invertebrate diversity, even in gardens that might seem very neat, tidy and stocked with alien plants. The survey, conducted under a project called "BUGS" (Biodiversity in Urban Gardens) at Sheffield University, did not seem to support common ideas such as larger gardens being better than small ones. On the other hand, there can be little reason to doubt the harmful effects of building on existing gardens or of devoting only a small proportion of a development site to green space.

High-density developments, which are now the norm in the UK and other heavily populated countries, leave little room for habitats to develop, except where substantial root protection areas are delineated for trees. Also, in the mechanised process of site clearance and grading, every square centimetre of unprotected land is usually stripped of vegetation (and probably also topsoil), thus obliterating any existing habitats. Some of the older gardens that are now being targeted by developers contain relict woodland or the remnants of old orchards which pre-dated the construction of the existing houses.

It should be borne in mind that high-density developments can bring certain benefits, such as the concentration of human populations close to amenities, thus reducing the need for the use of private motor vehicles. On the other hand, human beings deserve to live close to green space and to the wildlife that it can support. Back garden developments are therefore a cause for concern in relation not only to wildlife conservation but also to the well-being of people.



## NEWS, VIEWS AND GENERAL INFORMATION

### Formation of Bumblebee Conservation Trust

The Bumblebee Conservation Trust (BBCT) is a new UK organisation, founded in response to growing concerns about dramatic declines occurring in the populations of many British bumblebee species. Based at the University of Stirling in Scotland, its current officers are as follows: Professor David Goulson (Director), Ben Darvill (Conservation



Ecologist), Jennifer Harrison-Cripps (Conservation Officer and Gillian Lye (Membership Secretary). The BBCT's stated aim is to raise awareness of the problems affecting bumblebees and to strive to prevent further decline in their populations. Activities planned by Jennifer Harrison-Cripps include national surveys, a programme of local training days and events and the provision of advice to landowners and wardens on site management.

The formation of BBCT seems to reflect the trend for taxonomic specialisation within the community of invertebrate naturalists, at least in the UK. During the 1990s, however, the concept of "unity of purpose" for conservation was developed among the UK invertebrate organisations, amid growing awareness that the conservation of invertebrates could be best achieved by means of a new structure or organisation covering all invertebrate groups but working alongside the taxonomically specialised conservation bodies which had already evolved. Eventually, at the turn of the Millennium, Buglife – The Invertebrate Conservation Trust was formed by the common consent of the existing bodies. Since then, there has seemed to be little need or desire to establish any new taxonomically specialised conservation groups but such a development could bring certain benefits if it ushers in additional human and financial resources.

The BBCT can be contacted at: School of Biological & Environmental Sciences, University of Stirling, Stirling, FK9 4LA (Tel: 01786 467759); e-mail: [enquiries@bumblebeeconservationtrust.co.uk](mailto:enquiries@bumblebeeconservationtrust.co.uk)

### **Giant earthworms in Australia and the USA**

ICN 41 included an item about the Oregon Giant earthworm *Driloleirus macelfreshi* in the Pacific Northwest of the USA, which has been undergoing population decline due to habitat loss and to a reduction of soil acidity in its remaining habitat areas, due to the activities of introduced European earthworms. Robert Pyle, founder of the Xerces Society, has recently written about these worms in the Society's *Wings* magazine. In the same issue of the magazine (Spring 2006), there is a news item about a related species, the Palouse giant earthworm *Driloleirus americanus* (also known as the lily worm because of its pleasant scent when handled), which occurs in eastern Washington State. This once abundant species was found last year only for the first time since 1978 and so appears to have become even more endangered than *D. macelfreshi*. Like *D. macelfreshi* it has been adversely affected by introduced European species and by habitat destruction; in this





instance, within the rich soils of the Palouse bunchgrass prairies, where its burrows have been found to extend as deep as fifteen feet (nearly five metres) during dry weather.

Perhaps better known are the giant earthworms of Australia. Whereas *D. macelfreshi* and *D. americana* can reportedly reach three feet (0.9m) in length and an inch (25mm) in diameter, the Giant Gippsland earthworm *Megascolides australis* of south-eastern Victoria in Australia can reach up to 13 feet (4.0m) when stretched, although its body diameter is slightly less than that of *D. macelfreshi*, being 0.75 inches (20 mm). It has a pinkish-grey, fragile body with a dark purple head.

Like its American counterparts, *M. australis* has been undergoing a serious decline in its populations. Land-use by non-aboriginal Australians has resulted in adverse disturbance and changes in soil conditions. *Megascolides australis* has been affected specifically by degradation of moist stream banks in clayey areas, which are its sole habitat. Its physical fragility also makes it very sensitive to direct disturbance, such as digging or handling by humans. Another vulnerable feature of the species is that individuals take a long time to develop. The egg capsules, which are 2-3 inches (5-7.5 cm) in length, require over 12 months' incubation. The hatchlings, which are 20 cm long, take about five years to mature.

Activities which are thought to be causing the decline of *M. australis* include the clearance of land for agriculture, trampling by livestock, and destruction of stream banks. Further harm is caused by any activity which reduces soil water quality, such as the use of pesticides and fungicides. Attempts are therefore being made to encourage landowners to modify their practices; for example by fencing in their stream banks and setting aside protective areas. Also, the species now has legal protection, so that anyone doing research on the species requires a permit.

### **Concern about loss of biodiversity in UK residential areas**

Following criticism that the UK government has been encouraging inappropriate and environmentally harmful development within residential back gardens, several members of parliament, led by Greg Clark, supported an Early Day Motion on 10th May 2006 entitled "Removal of Gardens From Brownfield Definition". The Motion is intended to reverse a government guideline which instructs planning authorities to approve the development of back-gardens like other 'brownfield' sites.



The Early Day Motion reads as follows: "That this House shares the concern of communities throughout the United Kingdom over the scale of residential development on garden land; recognises that the density and speed of such development can cause irreparable damage to neighbourhood character and cohesion; notes that the loss of garden land threatens urban biodiversity and environmental sustainability in towns and cities; further notes that garden land developments rarely exceed the threshold at which affordable housing must be provided and displaces the regeneration of derelict land; believes the official classification of garden land as brownfield to be inappropriate and misleading; and therefore urges the Government to amend all relevant planning guidance to remove gardens from the definition of previously developed land and thereby return decisions over proposed garden land developments to the discretion of local planning authorities".

Back gardens undoubtedly support a high proportion of the invertebrate fauna of towns and cities and so any move to protect them is welcome, even though the management of some of them leaves something to be desired as far as biodiversity is concerned. Thus the alteration of UK planning guidance, as stated in the Early Day Motion, could go some way towards slowing down the alarming decline in invertebrates such as bumblebees and a wide range of moth species.

### **Cypermethrin sheep dips banned from sale in the UK**

Following a recommendation by the Environment Agency, the licence allowing the marketing of cypermethrin sheep dips in the UK was suspended in late February 2006 by the government's Veterinary Medicines Directorate (VMD). Meanwhile, however, farmers will still be permitted to use their existing stocks of cypermethrin.

As mentioned in several recent issues of *ICN*, cypermethrin sheep dips have often proved to be a very potent cause of mortality in populations of aquatic invertebrates, including critically endangered species such as the White-clawed crayfish, *Austropotamobius pallipes*. Cypermethrin also seriously impairs the reproductive capacity of the Atlantic salmon, *Salmo salar* and other fish species. It is estimated that contamination from these sheep dips has wiped out most of the animal life within at least 1,000 miles (1,625 km) of river in the UK each year.

In addition to evidence-gathering by the Environment Agency, various organisations have been campaigning for a ban and have welcomed the VMD's decision. They include the Salmon and Trout Association, the Anglers' Conservation Association, the Atlantic Salmon



Trust, the National Association of Fisheries and Angling Consultatives (NAFAC) and, recently and notably, Buglife – The Invertebrate Conservation Trust.

The other side of the argument is that there is currently no acceptably safe alternative to cypermethrin as a sheep dip against sheep scab, a serious skin condition, which is caused by a burrowing mite, *Psoroptes ovis*. Due to the importance of sheep scab in relation to animal welfare and economic loss, the use of sheep dips containing organophosphates was formerly compulsory in the UK. Unfortunately, these substances can be highly toxic to humans and they were causing serious long-term illness amongst farm workers. It was for this reason that their compulsory use was discontinued and that cypermethrin, a synthetic pyrethroid, was made available, with unintended but disastrous consequences for the wildlife of many streams and rivers.

Although the ban on cypermethrin and the health risks associated with organophosphates seems to leave farmers without any satisfactory form of sheep dip, they can use alternative treatments based on internally administered or pour-on products. These too, however, might also have drawbacks. For example, one of the available veterinary drugs is ivermectin, which is highly toxic to a very wide range of invertebrates. Subcutaneous injections of ivermectin protect sheep against scab, as well as curing it, but not for as long as cypermethrin dips. A longer-lasting formulation of ivermectin has been successfully tested in the form of an intra-ruminal bolus. This treatment could become an economically acceptable replacement for cypermethrin dips, but the excretion of ivermectin in sheep dung could have very serious effects on the dung fauna, as are already occurring with the widespread use of ivermectin against intestinal worms in a variety of livestock species.

Prevention of scab, for example by means of quarantining bought-in sheep, is also helpful but has sometimes been neglected because sheep dips can compensate for poor husbandry.

Since cypermethrin currently remains the main choice for convenience and operator-safety, farmers' organisations are campaigning for the rescindment of the ban. In Scotland, they have gained the support of the Scottish Executive. However, the conditions for rescindment include the need for the manufacturers to demonstrate that their products are not causing environmental damage. In view of the inescapable evidence to the contrary, this condition can clearly not be met. Even if the need for proof could be over-ridden politically, the





manufacturers would still be required to make recommendations for risk management strategies to reduce the risk to the environment. This also seems a tall order, since the potency of cypermethrin is so great that even the most careful farmers have sometimes been prosecuted for 'river-kill' incidents. Even the official advisory organisation, ADAS, was fined £5,000 for such incidents on its own model sheep husbandry unit in December 2005.

### **Biodiversity Action Plan: publication of the UK Steering Group Report**

The Biodiversity Action Plan (BAP) system was developed as part of the UK's commitment under the Rio protocols of the early 1990s. When the idea of listing BAP invertebrate species was first proposed, there were concerns that too little was known about many of the candidates and that the lists would therefore be arbitrary and potentially misleading in relation to the allocation of resources. Experience has shown that, although such concerns were valid in many cases, the BAP process has been a major catalyst for invertebrate conservation in the UK. There can be little doubt that far less would have been achieved in its absence. Also, a review process has recently been providing some opportunity to re-consider the listing of species which may have been either included or excluded in haste and without adequate data. Also, the criteria for inclusion of species in the BAP Priority list have been undergoing review.

For the review of BAP Priority invertebrates, the relevant government body, the Joint National Conservation Committee (JNCC), has been working with Invertebrate Link (InvLink), the umbrella group which includes the main invertebrate organisations and a range of other national organisations. A small working group, including InvLink members and Deborah Procter of JNCC, has reviewed about 600 provisionally proposed species, with the aid of a team of taxonomic specialists, employed under government contract via Buglife – The Invertebrate Conservation Trust. By the end of 2005, about 500 of these species had been selected as appearing to meet the criteria for listing.

In addition to the review of the Priority Species list, the working group has prepared draft recommendations, stating, for example, whether Species Action Plans (SAPs) are appropriate for particular taxa. Representatives of the 'country agencies' for England, Scotland and Wales have undertaken an additional process for proposing species for listing and it has become necessary this year to reconcile the different sets of proposals.





With about 500 Priority Species, invertebrates will continue to be far more restrictively listed than, for example, birds. Nevertheless, it is felt that 500 will seem a large number if every species is to have a totally independent Species Action Plan (SAP). For this reason, the working group has tried to group the species in relation to habitats, so that joint plans can to some extent be developed. Habitat Action Plans (HAPs) already exist alongside SAPs, but the intention is for each group of species to represent a micro-habitat at a finer level that would be recognised under a HAP.

The final list is to be submitted to Defra, with the aim of publishing lists of Priority Species for all taxa later this year.



## SITES AND SPECIES OF INTEREST

### Update on Stag beetle survey

The survey of the UK's largest beetle, *Lucanus cervus*, launched by the People's Trust for Endangered Species (PTES) in 1998 (see ICN 38), is continuing. The first and second phases of the survey showed strong populations in southern England, especially in Richmond Park, Wimbledon Common and Epping Forest in the London area and the New Forest in Hampshire. The records showed small and scattered populations further north and west, including a possible one in south Wales. Although the surveys revealed some populations that were not previously documented, it is thought that the species has become extinct within parts of its natural range, perhaps due to human activities which have depleted its deadwood habitat. The PTES has also reported anecdotal evidence which suggests that populations are declining in many areas. It is hoped that the current survey will help to build up a long-term picture of how the beetles are faring.

The previous surveys showed distinct geographical patterns of distribution, which revealed that soil type and micro-climate are important factors in addition to the presence of suitable deadwood habitat. The eggs are laid below ground-level, and so there is a preference for soil which can be easily dug by the females. Also, the beetle requires a rather warm and dry climate, which in Britain is mainly confined not only to the southern half of the country but also to relatively low elevations.



In the current phase of the survey, the PTES is particularly keen to receive records of the stag beetle from the counties on the edge of the known range within England. These are as follows: Cambridgeshire, Devon, Gloucestershire, Lincolnshire, Norfolk, Warwickshire, Worcestershire and Yorkshire. The PTES can be contacted by phone on +(44) 0207 498 4533 or via its website: [www.ptes.org](http://www.ptes.org)

### ***Malacosoma americanum*: a parallel with the ragwort story?**

The recent 'war' on ragwort *Senecio jacobaea* in England provoked the ire of people who were concerned about the prospects of excessive and legally enforced control of this native plant. The fate of invertebrate species dependent on ragwort (of which about thirty are either species-specific or nearly so in the UK) was of particular concern. On the other side of the argument were many owners of horses who had become convinced that ragwort poisoning incidents had greatly increased. In the end, a new law was enacted so as to strengthen the enforcement of ragwort control, but it was accompanied by a code of practice which now provides a basis for limiting control to areas where it is necessary and where it would not harm areas designated for wildlife.

Another animal health problem with some potential parallels to the ragwort story has recently emerged in the USA. Instead of ragwort, the culprit is an insect; the Eastern tent caterpillar *Malacosoma americanum*, a communal web-forming species with a hairy blue body, spotted with brown and gold. There is a new hypothesis that ingestion of the hairs or spines by mares can lead to a condition known as Reproductive Loss Syndrome (MRLS) in eastern parts of the USA. This condition is believed to have caused a 30% reduction in the production of foals and hence great economic loss in the Ohio Valley in the State of Kentucky in 2001 and 2002.

It has been suggested that MRLS develops after the mares ingest the final-instar caterpillars, which migrate in springtime across pastures from the trees on which they have been developing. The hairs or spines pierce the mare's intestinal lining and can introduce gastrointestinal bacteria, principally *Streptococcus* spp., into the bloodstream. These bacteria are transported to various organs, including the placenta and the developing embryo or foetus, where they cause septicaemia and sometimes also abortion.

In view of the problem for horse breeders, there has been an urgent call for control measures against *M. americanum*, although there does not seem to have been any move towards legally enforced control.



Research workers at the University of Kentucky have evaluated control measures, including the insecticidal treatment of host trees (some species of which are commercially grown in fruit orchards) by foliar spraying or trunk injection. A more environmentally friendly and specific control method is to scrape off the overwintering egg masses, which are laid around twigs of the host tree. Also, the webs or 'tents' or the twigs to which they are attached can be physically removed prior to spring migration and pupation.

As *M. americanum* is relatively common and can reach pest proportions as a defoliator of fruit trees, there is perhaps no serious cause for concern about its conservation status if control measures are stepped up due to concern about MRLS. If, however, insecticides are increasingly used on a variety of tree species, there could be a more serious cause for concern about the fate of non-target invertebrates. There has, however, apparently been no suggestion in the USA that any conservation issues may exist.

### **Island Marble butterfly: candidate for the US Endangered Species Act**

In 2002, the Xerces Society and other conservation groups in the USA petitioned the U.S. Fish and Wildlife Service in support of the listing of the Island Marble butterfly *Euchloe ausonides insulanus* under the Endangered Species Act. This is one of three subspecies of *E. ausonides*, the other two being quite widely distributed in the Pacific regions of Canada or the north-western USA. Formerly found in coastal parts of British Columbia, in an area isolated from the other subspecies, it was thought to have become extinct by 1908, but was rediscovered in the adjacent area of San Juan Island in Washington State, USA, in 1998.

The following notes are based on a news item in *Wings*, the magazine of the Xerces Society, and on information provided by John Fleckenstein on the website of the Center for Biological Diversity.

The larval foodplants of this white and greenish butterfly are uncertain, but the other subspecies are known to feed on species of mustard *Arabis* spp. of the Brassicaceae. The original records were not accompanied by habitat data, but the data labels on museum specimens suggest that the habitat consisted of grassland within low-lying Garry Oak woodland and on lower south-facing slopes. Garry Oak woodlands have a dry near-Mediterranean climate and form the most biologically diverse ecosystem in the region. They are generally under threat and their protection is being sought by conservation groups. This



type of habitat occurs on San Juan Island, where the surviving populations of the Island Marble were found.

The main current threats to the Washington populations are thought to include unfavourable management, including controlled burning and herbicide application within San Juan Island National Historic Park. Drift of *Bacillus thuringiensis* var. *kurstaki* from aerial spraying against the Asian Gypsy moth *Lymantria dispar* across nearby areas could be a further threat. Also there is encroachment of roads and paths from surrounding housing developments. None of these factors applied before 1908, and so the extinction of the butterfly within neighbouring British Columbia is thought to have been due to some other factor. This was probably grazing by sheep or cattle, which, in addition to trampling and altering the floristic composition, would have directly removed the upper parts of the foodplants, on which the eggs and larvae occur.

In response to the petition, the U.S. Fish and Wildlife Service has determined that legal protection of the butterfly may be warranted, but a decision will not be made until November 2006. Protection would involve a requirement for co-operation between the site managers at San Juan Island at the Fish and Wildlife Service. There would also be funding for much-needed surveys and research.

### **Fisher's Estuarine moth in England**

Fisher's Estuarine moth *Gortyna borelii* is a mainly Mediterranean-Asiatic species, which is extremely local in western Europe and has been recorded only at six localities in the UK, all of them in the Hamford Water Estuary, Essex. In the UK, the moth was the subject of some controversy prior to its addition in 1997 to the list of species fully protected under Schedule 5 of the Wildlife and Countryside Act 1981. Everyone who had studied the moth agreed about the need for habitat protection (mainly against the destruction of the foodplant by inappropriate mowing of sea walls) but there was concern that the case for protection against collection was based on doubtful evidence of the alleged threat.

Our last update on the conservation of *G. borelii*, in 2002, was based on a report in *Lepidoptera Conservation Bulletin* No. 3, published by Butterfly Conservation (BC). This concerned the results of studies which helped to confirm the view that excessive mowing of the sea wall was detrimental to the moth. The studies also revealed valuable information about oviposition and larval behaviour, which helped to pinpoint the moth's habitat requirements.





The latest edition of *Lepidoptera Conservation Bulletin* (No. 7, April 2005 to March 2006) provides news of management projects that have been introduced following the earlier studies. These include both habitat creation and the modification of mowing regimes on existing habitat sites. Habitat creation has involved the large-scale planting of the foodplant, Hog's fennel *Peucedanum officinale* at eight secure sites on the north Essex coast. Of these sites, which were selected as being beyond the reach of rising sea level, four consist of established grassland, while the other four are on agricultural land, which was ploughed and seeded with suitable grasses before the planting of the Hog's fennel, of which 1000 and 2000 plants were introduced at each site.

Habitat creation can be regarded as form of gardening, which should arguably be the exception rather than the rule in wildlife conservation. Wildlife gardening probably has a good rationale in the case of UK populations of *G. borelii*, which are restricted to a narrow coastal zone, from which they probably not be able to disperse successfully in the face of anthropogenic climate change.

The management of the natural habitat sites, based on the recent studies and organised from Writtle College, Essex, now includes the implementation of a sympathetic mowing regime by the Environment Agency. Also, monitoring is being conducted at both the natural and the created habitats, so as to identify trends in relation to management.

Current funding is being provided by the Essex Economic Partnership and the East of England Development Agency, with contributions from Natural England, Essex Biodiversity Partnership, Environment Agency, the Cambridgeshire and Essex Branch of BC and Tendring District Council. It is hoped that further funding will be provided, so as to develop an agri-environment scheme for the payment of grants to farmers in return for sympathetic management.



## FUTURE UK MEETINGS

### Invertebrate Link

– 9th November 2006 – National conference at the Flett Theatre, Natural History Museum, London. In view of serious concerns about the apparent decline in the number of young people in the UK showing an interest in invertebrates, the next in the series of Invertebrate Link's conferences is to be entitled "Who will watch the small things that run



the world: recruiting the next generation of invertebrate specialists". This is a quotation from E.O. Wilson, and is often used by Buglife, of which Prof. Wilson is a Vice-president. The conference is intended to cover solutions as well as problems and there is therefore a plan to publish the proceedings so as to provide ideas and guidance. The intention is to bring together representatives of the various constituencies involved in inspiring or educating the next generation. These people include, for example, members of the formal education sector, others involved in training and education, publishers of field guides and other relevant material, as well as employees of the popular media. In view of these aims, invitations to members of the invertebrate community will be on an individual basis, but anyone who has a special interest in education is free to express an interest in attending. Members of the InvLink constituent organisations could do so via their representatives.

The list of speakers and discussion-leaders, which will be published in due course, is to include Dr Roger Key of Natural England, who gave a most inspiring talk on a related subject at the last main conference of the Royal Entomological Society in Brighton.

### **Wiltshire Wildlife Trust**

– Saturday 19th August, 10.a.m. - 12.30 p.m. – Dragonflies along the Bybrook", a walk with Tony Coultiss. Meet at the Recreation Ground Car Park, grid ref. ST 823 686; stout footwear required; fee £2 per adult, children free. For details contact Jill Legge, tel. 01380 722175.

### **Epping Forest Field Centre**

– Sunday 16th July – Insects, spiders and other invertebrates (leisure learning course): tutor, Geoffrey Kibby. Fee £32, incl. lunch; £3.00 discount for London Wildlife Trust members. Details from the Centre, tel. 0208 502 8500.

### **Butterfly Conservation and Atropos**

– Saturday 23rd September – National Moth Night. The date of this annual event varies so as to focus the effort of recording on different seasons. Participants throughout the British Isles are encouraged to record moths on the designated night at their chosen locations and to submit their results for pooling. There are also public events around the UK. Further information is available from: [www.nationalmothnight.info](http://www.nationalmothnight.info)

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### NOTICE

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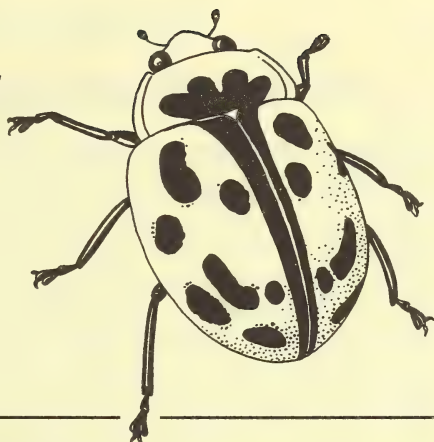
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# INVERTEBRATE CONSERVATION NEWS



**No. 51, October 2006**

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## EDITORIAL

For many years, field naturalists in various countries have had the worrying impression that invertebrates have been declining in diversity and abundance but there has been relatively little hard evidence for this. Recently, however, the analysis of data from long-term monitoring of certain taxa such as moths in Britain has shown that there really is serious cause for concern, at least for those taxa. As mentioned in this issue of *ICN*, the latest of these analyses shows evidence of declining diversity among populations of wildflowers and their associated bee species in Britain and the Netherlands.

Research on invertebrate diversity tends to focus on taxa which either have direct economic importance (e.g. as pollinators) or attract public support because they are large and attractive. In the UK, however, the Biodiversity Action Plan (BAP) has stimulated work on species representing a wider range of taxa, which have been included in the BAP Priority list. There is, however, still little known about the conservation status of other species within these taxa, even in the case of important insect orders such as the Coleoptera (beetles). Recently, Buglife – The Invertebrate Conservation Trust has drawn attention to the fact that 250 British beetle species (about 6% of the total) have not been recorded since 1970. Some of these species could be nationally extinct or heading for extinction but others have perhaps simply not been seen because they are hard to find and have not been included in surveys.

In the absence of comprehensive survey data for many taxa, there seems reason to fear that the story of decline amongst bees and the larger Lepidoptera represents the tip of an iceberg. Clearly, more effort is required to see whether this is the case and to help identify ways of stemming and perhaps reversing the declines which seem to be taking place.



## NEWS, VIEWS AND GENERAL INFORMATION

### Landscape-scale management for butterflies

The ability of invertebrates to migrate between sites of suitable habitat is now recognised as a key requirement for the conservation of many, if not all, species. It is of course possible to manage individual nature reserves intensively, so as to help counteract chance local extinctions, but the feasibility of such 'gardening' is probably limited to a few flagship species. Thus, landscape-scale projects within the wider countryside are increasingly being built into conservation strategies within the UK, at least as far as butterflies are concerned. As mentioned in *ICN 47* for example, the Countryside Council for Wales (CCW) has identified a number of sites as candidate Special Areas of Conservation (cSACs), with landscape-scale conservation of the Marsh Fritillary butterfly *Euphydryas aurinia* in mind. CCW has also been developing agri-environment schemes in co-operation with farmers, so as to help maintain suitable habitat for the butterfly outside the formally designated areas.

Butterfly Conservation is currently involved in 67 landscape-scale projects in the UK and has recently begun five new major projects, each with its own dedicated project officer. These are as follows: (1) the "Re-connecting the Culm project" in north Devon, (2) the "Two Moors Project", covering Dartmoor and Exmoor (Devon and Somerset) and involving species such as the Straw Belle moth *Apsitantes gilvaria gilvaria*, (3) the "Herefordshire Woods Project" in Western England, (4) the "North York Moors Project" and (5) the "Working with Butterflies, Moths and People Project" in the Scottish Highlands.

### UK: River Invertebrate Monitoring for Anglers Initiative

This initiative, which is to be launched at a conference in March 2007 (see "Future UK meetings", below) is designed to help angling groups monitor and report the occurrence of any severe deterioration in the water quality of their rivers. It involves a simple method of kick-sampling at registered sample sites.

The initiative has been developed by members of the Natural History Museum (London), the John Spedan Lewis Trust and the organisers of various recording schemes for aquatic invertebrates. Co-operating organisations include the Environment Agency and the Salmon and Trout Association.



## **Re-organisation of governmental conservation and research in the UK**

From the beginning of October 2006, English Nature merges with two other England-based agencies to form "Natural England". The other two agencies are the Rural Development Service and the Landscape, Access and Recreation Division of the Countryside Agency. Sadly, the integration of English Nature into the new structure comes at a time when substantial cuts are being made in the budget of Defra, the government department concerned. The implications of this are yet to be fully revealed in detail, but there have already been instances in which anticipated grants to the voluntary sector have not been forthcoming.

Meanwhile, cutbacks are going ahead at the UK-wide research organisation known as the Centre for Ecology & Hydrology (CEH). The cutbacks were proposed last December by CEH's parent body, the Natural Environment Research Council (NERC), in a consultation exercise. The intention was to close four research stations: at Banchory (NE Scotland), Winfrith (Dorset), Monks Wood (Cambridgeshire) and Oxford, while retaining the other four at Bangor (North Wales), Edinburgh, Lancaster and Wallingford (Oxfordshire). The NERC argued that the existing structure of CEH was unsustainable and that the overall quality and quantity of research could be maintained more cost-effectively by reducing the number of research stations and by promoting partnerships with universities and other research organisations.

A number of invertebrate societies, including the AES, expressed serious concern about the proposed cutbacks. Also, a letter was sent by the umbrella organisation, Invertebrate Link (JCCBI). The views expressed were essentially that the proposed closure of key CEH sites and the loss of one third of scientific staff, could only reduce the quality and quantity of wider, biodiversity-related research in the UK at a time when such research is urgently needed, particularly in the context of current threats to biodiversity from environmental change. Also, it was argued that the idea of farming out the research effort to universities was ill-judged, since the work of university research workers often depends on collaboration with their CEH counterparts and on the data collected and collated by the CEH network.

We now report with concern that the cutbacks are proceeding more or less as proposed, despite all the objections. This comes as disappointing news, which is now heightened in England by the cuts to the agencies which work under the umbrella of Defra.





## SITES AND SPECIES OF INTEREST

### Thursley Common, Surrey, SE England

In July 2006, most of this national nature reserve was swept by a heathland fire. It will take some time to determine how many species, if any, were wiped out on the reserve, but the interim news is good for at least some of the rare species which have been recorded there. It is reported that some pockets of the reserve remained relatively untouched, allowing the survival of species such as the Wood Tiger beetle *Cicindela sylvatica* and the Silver-studded Blue butterfly *Plebejus argus*.

A similarly extensive fire occurred in the summer of 1976, which was one of the driest on record and which produced some of the highest July temperatures recorded in England during the last century. When, in 1977, an AES field meeting was held at the reserve, there were signs that patches of burnt vegetation were regenerating from roots that had survived below ground. Also, some of the wettest parts of the bog at Thursley seemed to have remained moist enough during the summer drought to escape total incineration. Quite a range of insects, including dragonflies and aquatic beetles, had evidently survived the 1976 fire but it was not possible to record them in any detail, since the warden who hosted the meeting forbade any collection of specimens. The experience of 1976 does, however, suggest that there may eventually be a good recovery of habitats and populations.

### ***Anisodactylus poeciloides*: a coastal carabid beetle in England**

As mentioned in *ICN 40*, this beetle is one of the UK "BAP" priority-species included in the project "Action for Invertebrates", run by Ian Middlebrook, who is now based at the Butterfly Conservation headquarters in Dorset. Ian has recently reported that the survey contractors have made some new discoveries of the beetle along the east coast of southern Britain. Having already found some previously unrecorded colonies in Essex, Peter Hammond has found another one at Aldeburgh, Suffolk, which now represents the most northerly record of *A. poeciloides* in the UK. Meanwhile Alex Williams has continued his survey work in north Kent, where he has confirmed the presence of the beetle at all the recorded sites and at two further sites at Conyer and Seasalter. Also, the beetle was one of the species featured in a workshop in July 2006, highlighting the value of marginal saline habitats. The workshop was held in North Kent and included a visit to the RSPB reserve at Cliffe Pools, where the beetle was sighted.



## Heath Fritillary butterfly in SW England: habitat management

The August 2006 edition of *British Wildlife* magazine carries a report of success in restoring the habitat of the Heath Fritillary *Mellicta athalia* in Exmoor, south-west England. In 1989, the Exmoor population of this butterfly was found to be the strongest in the UK, where it is nationally endangered. Ten years later, however, it had declined so much that it seemed to be on the verge of extinction in Exmoor. The reason appeared to be suppression of the butterfly's foodplant, Common Cow Wheat *Melampyrum pratense*, by encroaching bracken *Pteridium aquilinum*. Bracken encroachment had, however, been prevented by rotational burning at a site just outside the Exmoor National Park boundary, with the result that the butterfly was still thriving there.

In view of the apparent beneficial effect of burning, some trial plots were set up on a nearby National Trust site called Bin Combe, where the butterfly had either declined or become locally extinct. In some of the trials, burning was supplemented with the use of the herbicide Asulox, which is often used for controlling bracken. The treatments were found generally to encourage the regeneration of bilberry *Vaccinium myrtillus*, together with the Common cow wheat, which is a root parasite of the bilberry. Red deer *Cervus elephas* were attracted to the bilberry and their trampling helped to enhance the suppression of bracken.

As a result of the Cow wheat regeneration, populations of *M. athalia* have recovered dramatically, so that counts of individuals in 2006 were as high as those recorded during the peak of the late 1980s and early 90s, when Exmoor ranked as the best UK stronghold of the species. It is also noted in the report that the butterfly re-colonised two sites, beyond the Bin Combe trial plots, from which it had disappeared. This involved the immigration of individuals from Bin Combe, over a distance of 2 km and across a ridge more than 500 m high.

The report in *British Wildlife* magazine formed part of "Habitat Management News", which is compiled by Conservation Management Advice within the Royal Society for the Protection of Birds. According to a subsequent report by the National Trust's representatives on Invertebrate Link (Matthew Oates and Andy Foster), there remains a need to secure funding for continuation of this work.

## Return of wetland species to former conifer plantations in the New Forest, SE England

Another report from Matthew Oates and Andy Foster of the National Trust (NT) concerns two stands of planted conifers; Newlands and



Foxbury Plantations. Newlands Plantation has recently been clear-felled, exposing some of the habitat features which pre-dated the conifers. These include mire habitats along the valley of Dockens Water and heathland on the slopes above. A survey in 2002, prior to clear-felling most of the conifer stand, did not reveal any notable species, but several were found this year, soon after clear felling had taken place. These include three Nationally Scarce species: the Small Red damselfly *Ceriatagrion tenellum*, the Bog bush cricket *Metrioptera brachyptera* and a water beetle *Helochares punctatus*.

The NT owns some areas of high quality mire and heath in adjoining areas and has recently acquired Foxbury Plantation, much of which is destined to be clear-felled, like Newlands. It is hoped that the heath, mire and other wetland habitats will thereby be restored and that invertebrates will re-colonise the site from the nearby refugia. Foxbury Plantation already includes some bog moss pools and tussocks of Purple Moor grass *Molinia caerulea*, which have been found to harbour scarce species such as the jumping spider *Evarcha arcuata* and the Raft spider *Dolomedes fimbriatus*. There are also areas of broadleaved semi-natural woodland and a scattering of veteran oaks, which are to be retained.

### **The Great Yellow bumblebee in north and west Scotland**

The Royal Society for the Protection of Birds (RSPB) is the Lead Partner for a number of bees on the UK Biodiversity Action Plan Priority list. These include the Great Yellow bumblebee *Bombus distinguendus*. The work has involved surveys, habitat studies, assessment of gene flow between colonies and the modification of site management, such as the alteration of seed mixes originally intended to enhance vegetation for birds such as the corncrake *Crex crex*.

Four main centres of population have been identified: five islands of the Outer Hebrides (the Western Isles); two islands of the Inner Hebrides; a narrow coastal strip of the northern Scottish mainland and sites on the Orkney Islands. In the Hebrides, the main habitat is winter-grazed machair grassland, some areas of which are being managed by the RSPB for corncrakes. These latter areas seem to provide especially good habitat for *B. distinguendus*. Elsewhere, changes in agricultural practices are a potential threat to the bee's habitat, but appropriate agri-environmental measures are being advocated.

The habitat requirements include a succession of suitable forage, which is required for completion of the life cycle. A variety of plant species provide suitable nectar sources, especially members of the Asteraceae and Fabaceae.





## The Aspen hoverfly in NE Scotland

The Aspen hoverfly *Hammerschmidtia ferruginea* is another of the insects for which the RSPB is the Lead Partner under the UK Biodiversity Action Plan. Its distribution and status have been reasonably well established through a collaborative study between RSPB, Scottish Natural Heritage and the Malloch Society. Six meta-populations have been identified in the Strathspey area of NE Scotland and a further four core populations have been found at isolated sites elsewhere. Surveys indicated that populations fell between 2002 and 2004, due to a shortage of suitable breeding material in the form of fallen, rotting wood. Subsequent high winds have, however, provided a new supply of fallen wood, which is becoming suitable for breeding as it rots. Also, the RSPB is attempting experimental management of aspen logs, so as to enhance the habitat. A survey in 2006 indicated that there were about 1000 larvae, compared with 300 in 2000-01.

## *Vertigo moulinsiana* and the Newbury bypass

This small snail, known as Desmoulin's Whorled snail, acquired a certain notoriety during confrontations ten years ago (see *ICN 21*) between conservation activists and the British government over the Newbury bypass in southern England. Its presence on the bypass route did not prevent the road from being built, and indeed it was slightly discredited as an emblem because it proved to be a little more widespread than perhaps had been portrayed by some activists. It is, however, on the Biodiversity Action Plan (BAP) Priority list and so there was no doubt that destruction of its habitats was contrary to the UK Government's endorsement of BAP under its international commitment to the Rio Convention. The valleys of the Lambourn and Kennet, both of which lay in the way of the bypass, contained the most important British populations then known of the snail.

During the public debate, at which time there were protestors camping in tents, up trees and in burrows on the sites, it was pointed that not only would the bypass wipe out some important colonies of *V. moulinsiana*; it would also destroy threaten other rare wetland species, including the water beetle *Rhantus suturellus* and the caddisflies *Mateype fragilis* and *Ylodes conspersus*.

In the face of campaigns and protests, the UK Government did not yield in its determination to build the bypass, but it announced that the snail would be saved by translocating specimens to a new site and by giving special protection (as a Special Area of Conservation) to nearby





sites along the Kennet and Lambourn rivers beyond the route of the bypass. This year, however, a report by Buglife – The Invertebrate Conservation Trust stated that the snail has died out on the translocation site and is not faring well in the other protected areas. The situation will, however, need to be monitored, as the snail's populations fluctuate considerably.

Chief Executive of Buglife, Matt Shardlow, has cited the evident failure of the Newbury translocation as an example of an inappropriate quick-fix solution. There have been other failed schemes where endangered species have been translocated from development sites, and so Buglife is currently calling for information on the success or failure of such schemes.

### **Adonis blue butterfly in the Cotswolds, SW England**

The National Trust for England Wales and Northern Ireland (NT) reports that the Adonis Blue *Lysandra bellargus* has re-appeared spectacularly in the Cotswold Hills, with nineteen colonies having been found after an absence of more than forty years. The results of exhaustive enquiries amongst breeders and dealers suggest that the re-appearance was natural, rather than anthropogenic. One possibility is that the butterfly spread from the north Wiltshire Downs in the late summer of 2003; this would be consistent with a wider pattern of spread, possibly linked to climate change. Of the nineteen colonies, thirteen are on sites managed under the NT's Cotswold Grazing Project.

### **British beetles: status of priority species**

Buglife – The Invertebrate Conservation Trust has recently highlighted the latest information on several British beetles on the Biodiversity Action Plan (BAP) Priority list. These include a wetland leaf beetle *Cryptocephalus exiguus*, recent records of which have been made at only one of the several sites where it was formerly known to occur. Even these records are four years old and there are fears that the species is now extinct at the site and perhaps in the UK. The site in question is Pashford Poors Fen, a small Site of Special Scientific Interest in the eastern county of Suffolk. Drainage of the surrounding agricultural fields has caused this wetland to dry out, with the consequent loss of many of the wetland plants such as Bog myrtle *Myrica gale*.

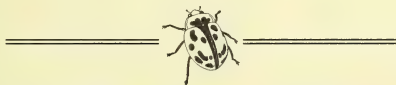
Another wetland beetle of some concern is *Laccophilus poecilus*, which was common in ditches on the Lewes Levels in the 1970s. It is



suspected, however, that the source of water has been polluted by runoff from a new road. This could explain why the beetle declined steadily to the point where it has not been recorded in the area since 2002. It was formerly known in Yorkshire but has not been seen there for many years. Among the ground beetles (Carabidae), *Dromius quadrisignatus* is a woodland species which used to be found in several ancient woodlands but has not been recorded since 1987, when it occurred at Bushy Park in London.

### **Barkflies (wild booklice): new recording scheme in the UK**

The launch of the first UK barkfly (Pscopotera) Recording Scheme, through the Biological Records Centre, has been announced in the newsletter of the National Biodiversity Network (Autumn 2006). The launch follows the publication of a new identification guide by Prof. Tim New, published by the Royal Entomological Society. The scheme organiser, Mr Bob Saville, has contributed a UK Psocoptera checklist to the MapMate recording program; this includes five species which have been newly recorded since 1998. He will welcome records from anywhere in the UK or the Irish Republic. He can be contacted via e-mail at [info@lothianwildlife.co.uk](mailto:info@lothianwildlife.co.uk) or c/o the Lothian Wildlife Centre, Caretaker's Cottage, Vogrie Country Park, near Gorebridge, Midlothian EH23 4NU.



## **RESEARCH NOTES**

### **New research on toxic effects of transgenic maize pollen**

Genetically modified (GM) crops are being grown on a large scale in many countries, but their use remains very restricted in others, including the member-states of the European Union. The restrictions reflect a variety of concerns, some of which are probably more well-founded than others. One of the more significant concerns is about crop varieties which have been modified so as synthesise insecticidal substances. The use of such varieties should in theory reduce the need to spray with pesticides but could, on the other hand, cause harm to populations of non-target invertebrates. Some of these feed on the crop without attaining pest status, while others feed on nearby food sources contaminated with pollen or other material derived from the crop.



Introduced insecticide-encoding genes are of special concern when they are able to spread, via pollen, into populations of wild plants which are related to the crop species. In Europe, this concern applies, for example, in the case of members of the Brassicaceae, which have many wild relatives. Maize has no close relatives among the wild plants of Europe, but there is some concern that the pollen of genetically modified maize will be ingested by non-target invertebrates feeding on the foliage of nearby plants.

Concern about toxic pollen was heightened by findings several years ago in the USA, as reported in *ICN 33* (October 2000). The first widely reported research showed that pollen from a variety of GM maize was toxic to caterpillars of the Monarch butterfly *Danaus plexippus*. The maize had been modified so as to synthesise the *Bacillus thuringiensis* (Bt) toxin. In one study, ill-effects on the Monarch were found after the caterpillars were fed on leaves of milkweed *Asclepias curassavica* that had been dusted with Bt maize pollen. A later study showed a similar effect on caterpillars feeding on milkweed surrounding fields of Bt maize. As mentioned in *ICN 36* (October 2001), however, later studies showed large differences between varieties of Bt maize in their pollen-toxicity to the Monarch and the American Black swallowtail *Papilio polyxenes*. This, together with considerations of experimental procedures, led to some doubt as to whether a serious problem existed.

New findings from Europe have now re-awakened concern about pollen toxicity in Bt maize. Workers at the Bavarian State Research Centre for Agriculture in Germany and the Institute of Environmental Sciences, at the University Zurich in Switzerland tested the toxicity of pollen from a variety of Bt maize known as "event Bt176" (cultivar Navares) on the larvae of the European Common Swallowtail butterfly *Papilio machaon*. (The term "event" is used because it describes a particular event in the laboratory when a Bt gene is transferred to the maize or other crop species; each such event produces a unique genetic line.) The trials were confined to the laboratory and could perhaps therefore be criticised for a lack of field-based data, but the Bt pollen was administered so as to simulate the range of concentrations encountered on wild plants growing near crops of maize. This was done by applying the pollen to leaf discs of Wild parsnip *Pastinaca sativa* L.

When the larvae of *P. machaon* fed on the leaf discs, those which were exposed to higher Bt maize pollen densities survived less well, having consumed more pollen grains. An average of only 13.72 grains was sufficient to kill half of the first-instars. Also, those that survived



despite having ingested the pollen were adversely affected; they consumed less of the foodplant, attained a lower body weight and took longer to develop. Pupal weight and the duration of the pupal period were also affected to some extent. Furthermore, the consumption of Bt-maize pollen by first instars had deleterious effects at the adult stage; i.e., a lower body weight in females and smaller forewings in males.

The authors concluded that permission for the commercial use of Bt maize in Europe should be considered only after more rigorous evaluation.

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- Lang, A. & Vojtech, E. (2006). The effects of pollen consumption of transgenic Bt maize on the common swallowtail, *Papilio machaon* L. (Lepidoptera, Papilionidae) *Basic and Applied Ecology* 7, 296–306.

### Evidence for decline in populations of pollinating insects

A comparison of almost a million pre-1980 and post-1980 records across both Britain and the Netherlands has shown a decline of the biodiversity of bee and hoverfly species in a majority of 10-kilometre squares for which data were available (52% of British squares and 67% of Dutch squares). In Britain, the greatest declines occurred among bee species which had already been rare before 1980. These included species which are relatively specialised feeders, depending on a narrow range of wildflower species. A parallel decline was detected in the diversity of wildflowers, leaving cause for concern that there may be a positive 'feedback loop' of decline between the less common plant species and their specialised insect pollinators. A further cascade of decline could be occurring among other associated species but further research would be needed to investigate such relationships.

A decline in bee diversity was found also in the Netherlands and this was accompanied by a decline in the abundance of wildflowers which depend specifically on bees for pollination. Wildflowers which can be pollinated by other insects have not declined in the Netherlands but the situation was somewhat different in Britain, where 75 insect-pollinated plant species declined in their distribution, while 30 wind-pollinated and self-pollinating species increased. Another difference between the two countries was in the diversity of hoverfly species. The diversity of hoverflies remained about the same in Britain before and after 1980 but increased in the Netherlands.

Regarding the conservation of bee species, this study heightens concerns about the plight of the more specialised species. These





include some of the longhorn bees, which collect pollen from wild peas; these have declined severely and there is one, *Eucera nigrescens*, which is no longer found in Britain. Another bee which might be nationally extinct is *Andrena lathyri*. Also, bees which depend largely on Field scabious *Knautia arvensis* have become much less abundant, together with this plant species, the flowering of which is often prevented by the early mowing of hay meadows. One bee species, *Andrena battorfiana*, is said to depend specifically on Field scabious.

It remains unclear whether pollination of crops is being affected by the decline in bee diversity. It seems possible that the overall level of pollination by bees might not have decreased, owing to the relative success of the more generalist species. The primary causes of the decline in specialist feeders also remain unclear, although it seems likely that changes in land use, the applications of agricultural chemicals and climate change may be important factors.

In the case of the Honey bee *Apis mellifera*, another group of research workers have undertaken a multifactorial study of data from Europe and North America; this identifies the involvement of several factors in the increase of mortality and of abnormalities and the disappearance of colonies. These include, as in the British and Dutch studies, a decline in the ecological diversity of farmland. Parasites, diseases and climate change are also implicated. Also, in France and Belgium, the new systemic insecticides imadocloprid and fipronil are thought to have been especially harmful.

There is cause for serious concern not only about bees and not only about the pollination of crops, but also about other invertebrates which are of less immediate economic importance and which therefore attract less funding for research. Where such funding does exist; for example in the case of the larger Lepidoptera, the results of surveys are similarly of concern in many respects.

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## PAST UK MEETINGS

### National Insect Week 2006

Following a gap in 2005, the UK's second National Insect Week (NIW), was launched in June 2006 by media presenters Kate Humble and Michael Buerk. Members of the AES participated in various events during NIW. These included a wildlife show at the Mole Valley Local Nature Reserve, Leatherhead, Surrey on 25th June, at which the society had a marquee and led bug hunts. The organiser of NIW, Prof. Chris Haines, attended the event and helped to man the AES stand. Due to extraneous interest in the World Football Cup, attendance was a little lower than might have been hoped, but the organisers were very pleased with the keen interest shown by members of the public, especially children.

## FUTURE UK MEETINGS

### Invertebrate Link

– 9th November 2006 – National conference at the Flett Theatre, Natural History Museum, London. “*Who will watch the small things that run the world: recruiting the next generation of invertebrate specialists*”. As mentioned in *ICN 50*, this conference is intended to identify solutions as well as problems.

The list of speakers and discussion-leaders has now been largely finalised and will include Roger Key of Natural England, Nick Baker (of media fame), Steve Tilling of the Field Studies Council, Lynn Hughes of Oxford Brookes University, Martin Sandford of the Suffolk Biological Records Centre and Mark Boyd of the Royal Society for the Protection of Birds.

### Riverfly partnership

– Tuesday 8th March 2007: The second National Riverfly Conference is to be held at the Natural History Museum, London. The conference will be used for the launch of a new scheme, the River Invertebrate Monitoring for Anglers Initiative (see above), described as “the neighbourhood watch scheme for rivers”.

Information from: b.peacock@nhm.ac.uk (Tel. 0207 942 5932) or p.barnard@nhm.ac.uk.

### Conference for National Societies and Recording Schemes

– 17th November 2006 – The sixth conference in this series, entitled “Who has been using our records”, is to be held at the Natural History Museum, London. Information from Trevor James via e-mail [tjj@ceh.ac.uk](mailto:tjj@ceh.ac.uk) or tel. 01487 772410.



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